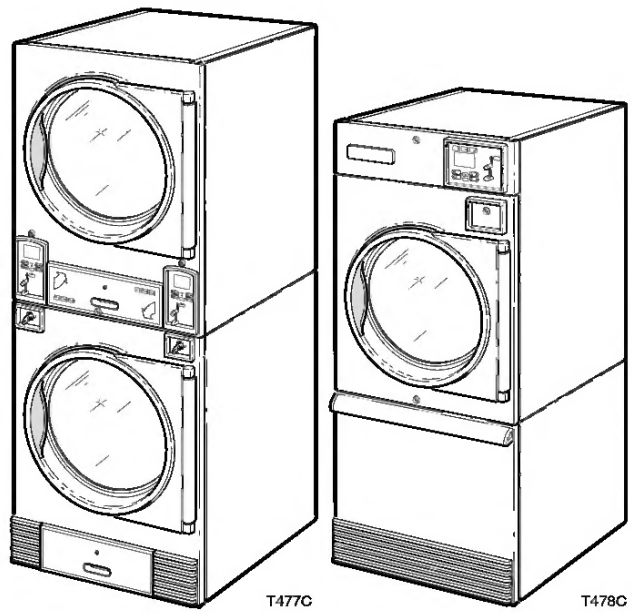
Drying Tumblers

25 Pound Capacity
30 Pound Capacity
35 Pound Capacity
Stacked 30 Pound Capacity
Through Serial No. 0602004143
Refer to Page 5 for Model Identification

Installation

NOTA: Para bajar una copia de estas instrucciones en español, visite www.comlaundry.com.



Keep These Instructions for Future Reference.
(If this machine changes ownership, this manual must accompany machine.)

Alliance Laundry Systems

www.comlaundry.com

Part No. 70269701R4
August 2006

Installation must conform with local codes or, in the absence of local codes, with:

In the U.S.A., installation must conform to the latest edition of the American National Standard Z223.1/ NFPA 54 "National Fuel Gas Code" and Standard ANSI/NFPA 70 "National Electric Code."

In Canada, installation must comply with Standards CSA-B149.1 or Natural Gas and Propane Installation Code and CSA C22.1, latest edition, Canadian Electric Code, Part I.

In Australia, installation must comply with the Australian Gas Association Installation Code for Gas Burning Appliances and Equipment.

WARNING

FOR YOUR SAFETY, the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death.

W033

- **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
- **WHAT TO DO IF YOU SMELL GAS:**
  - **Do not try to light any appliance.**
  - **Do not touch any electrical switch; do not use any phone in your building.**
  - **Clear the room, building or area of all occupants.**
  - **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
  - **If you cannot reach your gas supplier, call the fire department.**
- **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**

W052

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

W053

AVERTISSEMENT

POUR VOTRE SÉCURITÉ, les informations de ce guide doivent être respectées afin de réduire les risques d'incendie, d'explosion ou d'éviter les dommages matériels, personnels ou blessures mortelles.

W033Q3

- **Ne pas entreposer ni utiliser d'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil ou de tout autre appareil.**
- **QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ :**
  - **Ne pas tenter d'allumer d'apareil.**
  - **Ne touchez à aucun interrupteur. Ne pas vous servir des téléphones se trouvant dans le bâtiment où vous vous trouvez.**
  - **Évacuez la pièce, le bâtiment ou la zone.**
  - **Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.**
  - **Si vous ne pouvez rejoindre le fournisseur de gaz, appelez le service des incendies.**
- **L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.**

W052Q

POUR VOTRE SÉCURITÉ

Ne pas entreposer ou utiliser d'essence ou toutes autres vapeurs et liquides inflammables à proximité de cette unité ou de tout autre appareil.

W053Q2

IMPORTANT: Information must be obtained from a local gas supplier on instructions to be followed if tbe user smells gas. These instructions must be posted in a prominent location. Step-by-step instructions of the above safety information must be posted in a prominent location near tbe tumbler for customer use.

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Notes

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Introduction

Model Identification

Information in this manual is applicable to these models.

	Gas			Steam	Electric
25 Pound	CHD25G2-CA025L	HA025N	ST025L	CHD25S2-CT025S	CHD25E2-CT025E
	CHD25G2-CA025N	HT025L	ST025N	CHD25S2-CU025S	CHD25E2-CU025E
	CHD25G2-CT025L	HT025N	SU025L	DR25S2-BT025S	DR25E2-BT025E
	CHD25G2-CT025N	HU025L	SU025N	DR25S2-BU025S	DR25E2-BU025E
	CHD25G2-CU025L	HU025N	UA025L	HT025S	HT025E
	CHD25G2-CU025N	IPD25G2-IA025L	UA025N	HU025S	HU025E
	DR25G2-BA025L	IPD25G2-IA025N	UT025L	IPD25S2-IT025S	IPD25E2-IT025E
	DR25G2-BA025N	IPD25G2-IT025L	UT025N	IPD25S2-IU025S	IPD25E2-IU025E
	DR25G2-BT025L	IPD25G2-IT025N	UU025L	ST025S	ST025E
	DR25G2-BT025N	IPD25G2-IU025L	UU025N	SU025S	SU025E
	DR25G2-BU025L	IPD25G2-IU025N	YT025L	UT025S	UT025E
	DR25G2-BU025N	SA025L	YT025N	UU025S	UU025E
	HA025L	SA025N		YT025S	YT025E
30 Pound	CHD30G2-CA030L	HU030L	ST030N	CHD30S2-CT030S	CHD30E2-CT030E
	CHD30G2-CA030N	HU030N	SU030L	CHD30S2-CU030S	CHD30E2-CU030E
	CHD30G2-CT030L	IPD30G2-IA030L	SU030N	HT030S	HT030E
	CHD30G2-CT030N	IPD30G2-IA030N	UA030L	HU030S	HU030E
	CHD30G2-CU030L	IPD30G2-IT030L	UA030N	IPD30S2-IT030S	IPD30E2-IT030E
	CHD30G2-CU030N	IPD30G2-IT030N	UT030L	IPD30S2-IU030S	IPD30E2-IU030E
	HA030L	IPD30G2-IU030L	UT030N	ST030S	ST030E
	HA030N	IPD30G2-IU030N	UU030L	SU030S	SU030E
	HT030D	SA030L	UU030N	UT030S	UT030E
	HT030L	SA030N	YT030L	UU030S	UU030E
	HT030N	ST030L	YT030N	YT030S	YT030E
T30	CHD30STG2-CAT30L	HAT30N	NTT30N	CHD30STS2-CTT30S	CHD30STE2-CTT30E
	CHD30STG2-CAT30N	HTT30D	SAT30L	CHD30STS2-CUT30S	CHD30STE2-CUT30E
	CHD30STG2-CTT30L	HTT30L	SAT30N	DRST30S2-BTT30S	DRST30E2-BTT30E
	CHD30STG2-CTT30N	HTT30N	STT30L	DRST30S2-BUT30S	DRST30E2-BUT30E
	CHD30STG2-CUT30L	HUT30L	STT30N	HTT30S	HTT30E
	CHD30STG2-CUT30N	HUT30N	SUT30L	HUT30S	HUT30E
	DRST30G2-BAT30L	IPD30STG2-IAT30L	SUT30N	IPD30STS2-ITT30S	IPD30STE2-ITT30E
	DRST30G2-BAT30N	IPD30STG2-IAT30N		IPD30STS2-IUT30S	IPD30STE2-IUT30E
	DRST30G2-BTT30L	IPD30STG2-ITT30L		STT30S	STT30E
	DRST30G2-BTT30N	IPD30STG2-ITT30N		SUT30S	SUT30E
	DRST30G2-BUT30L	IPD30STG2-IUT30L			
	DRST30G2-BUT30N	IPD30STG2-IUT30N			
	HAT30L	MTT30N			

Table (continued)

NOTE: Control suffixes listed on next page.

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Table (continued)

	Gas			Steam	Electric
35 Pound	AT035L	HA035N	SU035L	AT035S	CHD35E2-CT035E
	AT035N	HT035L	SU035N	CHD35S2-CT035S	CHD35E2-CU035E
	CHD35G2-CA035L	HT035N	UA035L	CHD35S2-CU035S	DR35E2-BT035E
	CHD35G2-CA035N	HU035L	UA035N	DR35S2-BT035S	DR35E2-BU035E
	CHD35G2-CT035L	HU035N	UT035L	DR35S2-BU035S	HT035E
	CHD35G2-CT035N	IPD35G2-IA035L	UT035N	HT035S	HU035E
	CHD35G2-CU035L	IPD35G2-IA035N	UU035L	HU035S	IPD35E2-IT035E
	CHD35G2-CU035N	IPD35G2-IT035L	UU035N	IPD35S2-IT035S	IPD35E2-IU035E
	DR35G2-BA035L	IPD35G2-IT035N	YT035L	IPD35S2-IU035S	ST035E
	DR35G2-BA035N	IPD35G2-IU035L	YT035N	ST035S	SU035E
	DR35G2-BT035L	IPD35G2-IU035N		SU035S	UT035E
	DR35G2-BT035N	SA035L		UT035S	UU035E
	DR35G2-BU035L	SA035N		UU035S	YT035E
	DR35G2-BU035N	ST035L		YT035S	YU035E
	HA035L	ST035N		YU035S	

Includes models with control suffixes:

- 3O – DX4 OPL
- 3V – DX4 vended
- 3X – DX4 prep for coin
- BC – basic electronic, coin
- BL – basic electronic, central pay
- BX – basic electronic, prep for coin
- BY – basic electronic, prep for card
- CD – rotary coin drop
- CX – prep for coin
- CY – prep for card
- DO – DMP OPL
- DV – DMP vended
- DX – DMP prep for coin
- EC – EDC electronic coin
- EX – EDC coin ready
- EY – EDC card ready
- MT – manual timer
- NC – NetMaster coin
- NR – NetMaster card
- NX – NetMaster, prep for coin
- NY – NetMaster, prep for card
- OM – OPL micro
- ZC – NetMaster network coin
- ZR – NetMaster network card
- ZX – NetMaster network, prep for coin
- ZY – NetMaster network, prep for card

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Customer Service

If literature or replacement parts are required, contact the source from which the machine was purchased or contact Alliance Laundry Systems at (920) 748-3950 for the name and address of the nearest authorized parts distributor.

For technical assistance, call (920) 748-3121.

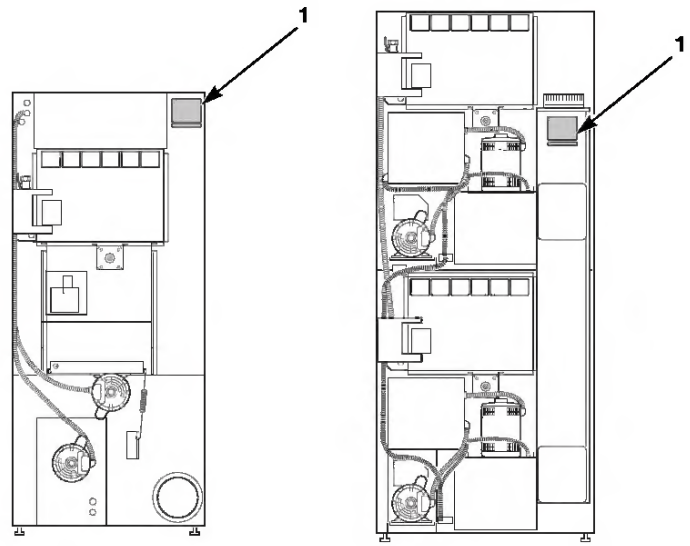
Serial Plate Location

When calling or writing for information about your product, be sure to mention model and serial numbers. Model and serial numbers are found on serial plate on rear of machine, and inside the loading door hinge.

Wiring Diagram

The wiring diagram is inside the junction or contactor box.

Models starting Serial No. 0309_____ or later will have the wiring diagram part number in the lower portion of the electrical data on the serial plate.



25, 30 AND 35 POUND T30

TMB2025N

1 Serial Plate

Conversion Table					
Multiply	**By**	**To Obtain**	**Multiply**	**By**	**To Obtain**
Btu	0.252	kCal	Pounds/sq. inch	0.06895	Bars
Btu	1055	Joules	Pounds/sq. inch	0.070	kg/sq. cm
Inch	25.4	Millimeters	Pounds (lbs.)	0.454	Kilograms
Inches W.C.	0.036	Pounds/sq. inch	Boiler Horsepower	33,479	Btu/hr.
Inches W.C.	0.249	kPa	Boiler Horsepower	34.5	lbs. steam/hr.
lb/inch^2 (psi)	6.895	kPa	CFM	0.471	liters/second
ft^3	28.32	Liters	kW	3414	Btu/hr.

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Notes

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Safety Information

Precautionary statements ("DANGER," "WARNING," and "CAUTION ") followed by specific instructions, are found in this manual and on machine decals. These precautions are intended for the personal safety of the operator, user, servicer, and those maintaining the machine.

DANGER

Indicates an imminently hazardous situation that, if not avoided, will cause severe personal injury or death.

WARNING

Indicates a hazardous situation that, if not avoided, could cause severe personal injury or death.

CAUTION

Indicates a hazardous situation that, if not avoided, may cuase minor or moderate personal injury or property damage.

Additional precautionary statements ("IMPORTANT" and "NOTE") are followed by specific instructions.

IMPORTANT: The word "IMPORTANT" is used to inform the reader of specific procedures where minor machine damage will occur if the procedure is not followed.

NOTE: The word "NOTE" is used to communicate installation, operation, maintenance or servicing information that is important but not hazard related.

WARNING

Failure to install, maintain, and/or operate this machine according to manufacturer's instructions may result in conditions which can produce serious injury, death and/or property damage.

W051R1

NOTE: Tbe WARNING and IMPORTANT instructions appearing in tbis manual are not meant to cover all possible conditions and situations tbat may occur. It must be understood that common sense, caution and carefulness are factors which CANNOT be built into this tumbler. These factors MUST BE supplied by the person(s) installing, maintaining or operating the tumbler.

Always contact your dealer, distributor, service agent or the manufacturer on any problems or conditions you do not understand.

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Save These Instructions

Important Safety Instructions

WARNING

Hazardous Voltage. Can cause shock, burn or cause death. Allow machine power to remain off for two minutes prior to working in and around AC inverter drive.

W359

1. Read all instructions before using the tumbler.
2. Refer to the ***Grounding Instructions*** for the proper grounding of the tumbler.
3. Do not dry articles that have been previously cleaned in, washed in, soaked in, or spotted with gasoline, dry cleaning solvents, or other flammable or explosive substances as they give off vapors that could ignite or explode.
4. Do not allow children on or in the tumbler. This appliance is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.
5. Before the tumbler is removed from service or discarded, remove the door to the drying compartment and the door to the lint compartment.
6. Do not reach into the tumbler if the cylinder is revolving.
7. Do not install or store the tumbler where it will be exposed to water and/or weather.
8. Do not tamper with the controls.
9. Do not repair or replace any part of the tumbler, or attempt any servicing unless specifically recommended in the user-maintenance instructions or in published user-repair instructions that you understand and have the skills to carry out.
10. Do not use fabric softeners or products to eliminate static unless recommended by the manufacturer of the fabric softener or product.
11. To reduce the risk of fire, **DO NOT DRY** plastics or articles containing foam rubber or similarly textured rubberlike materials.
12. Always clean the lint filter daily.
13. Keep area around the exhaust opening and adjacent surrounding area free from the accumulation of lint, dust, and dirt.
14. The interior of the tumbler and the exhaust duct should be cleaned periodically by qualified service personnel.
15. If not installed, operated and maintained in accordance with the manufacturer's instructions or if there is damage to or mishandling of this product's components, use of this product could expose you to substances in the fuel or from fuel combustion which can cause death or serious illness and which are known to the State of California to cause cancer, birth defects or other reproductive harm.
16. Tumbler will not operate with the loading door open. **DO NOT** bypass the door safety switch to permit the tumbler to operate with the door open. The tumbler will stop tumbling when the door is opened. Do not use the tumbler if it does not stop rotating when the door is opened or starts rotating without pressing or turning the START mechanism. Remove the tumbler from use and call the service person.
17. Tumbler will not operate with lint panel open. **DO NOT** bypass lint panel safety switch to permit the tumbler to operate with the lint panel open.
18. Do not put articles soiled with vegetable or cooking oil in the tumbler, as these oils may not be removed during washing. Due to the remaining oil, the fabric may catch on fire by itself.
19. To reduce the risk of fire, **DO NOT** put clothes which have traces of any flammable substances such as machine oil, flammable chemicals, thinner, etc. or anything containing wax or chemicals such as in mops and cleaning cloths, or anything dry-cleaned at home with dry-cleaning solvent in the tumbler.
20. Use the tumbler only for its intended purpose, drying water-washed fabrics.
21. **ALWAYS** disconnect the electrical power to the tumbler before servicing. Disconnect power by shutting off appropriate breaker or fuse.

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22. Install this tumbler according to these ***Installation Instructions***. All connections for electrical power, grounding, and gas supply must comply with local codes and be made by licensed personnel when required.
23. Remove laundry immediately after tumbler stops.
24. Always read and follow manufacturer's instructions on packages of laundry and cleaning aids. Heed all warnings or precautions. To reduce the risk of poisoning or chemical burns, keep them out of reach of children at all times (preferably in a locked cabinet).
25. Do not tumble fiberglass curtains and draperies unless the label says it can be done. If they are dried, wipe out the cylinder with a damp cloth to remove particles of fiberglass.
26. Always follow the fabric care instructions supplied by the garment manufacturer.
27. Never operate the tumbler with any guards and/or panels removed.
28. **DO NOT** operate the tumber if it is smoking, grinding, or has missing or broken parts.
29. **DO NOT** bypass any safety devices.
30. Solvent vapors from dry-cleaning machines create acids when drawn through the heater of the drying unit. These acids are corrosive to the tumbler as well as to the laundry load being dried. Be sure make-up air is free of solvent vapors.
31. Failure to install, maintain, and/or operate this machine according to the manufacturer's instructions may result in conditions which can produce bodily injury and/or property damage.

WARNING

To reduce the risk of serious injury, install lockable door(s) to prevent public access to rear of tumblers.

W055

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Notes

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Specifications and Dimensions

Specifications		25 Pound	30 Pound	T30	35 Pound
Noise level measured during operation at operator position of 3.3 feet (1 meter) in front of machine and 5.2 feet (1.6 meters) from floor		60 dBA	61 dBA	63 dBA	66 dBA
Net Weight (approximate): Pounds (kg)		300 (137)	330 (150)	550 (250)	360 (163)
Cylinder Size: Inches (mm)		26.5 x 24 (673 x 610)	26.5 x 30 (673 x 762)	30 x 26 (762 x 660)	30 x 30 (762 x 762)
Cylinder Capacity (dry weight): Pounds (kg)		25 (11.3)	30 (13.6)	2 x 30 (2 x 13.6)	35 (15.9)
Drive Motor Horsepower		1/4	1/4	1/4**	1/4
Fan Motor Horsepower		1/4	1/4	1/4**	1/4
Maximum Airflow per Pocket: C.F.M. (l/sec)	50 Hertz	410 (194)	410 (194)	320** (151)	470 (222)
	60 Hertz	450 (212)	450 (212)	350** (165)	520 (245)
Maximum Static Back Pressure: Inches W.C. (mbar)	50 Hertz	0.6 (1.5)	0.6 (1.5)	0.8* (2.0)	0.5 (1.3)
	60 Hertz	0.8 (2.0)	0.8 (2.0)	0.9* (2.3)	0.6 (1.5)
Gas Models					
Gas Connection		1/2 in. NPT	1/2 in. NPT	1/2 in. NPT	1/2 in. NPT
Gas Consumption: Btu/hr (kW, Mj/hr)		64,000 (18.7, 67.5)	73,000 (21.4, 77)	73,000** (21.4, 77)	90,000 (26.4, 95)
Electric Models					
Heating Element	400/50/3	10 kW	21 kW	21 kW**	24 kW
	Standard	12 kW			
Steam Models					
Steam Connection		3/4 in. NPT	3/4 in. NPT	3/4 in. NPT	3/4 in. NPT
Steam Consumption at 100 psig (6.9 bar): Boiler Horsepower (Btu/hr)		3.5 (121,000)	3.5 (121,000)	2.8** (97,000)	4.0 (137,000)
Steam Consumption at 15 psig (1.0 bar): Boiler Horsepower (Btu/hr)		2.4 (81,000)	2.4 (81,000)	2.0** (68,000)	2.8 (95,000)

*with both pockets running
**for each pocket

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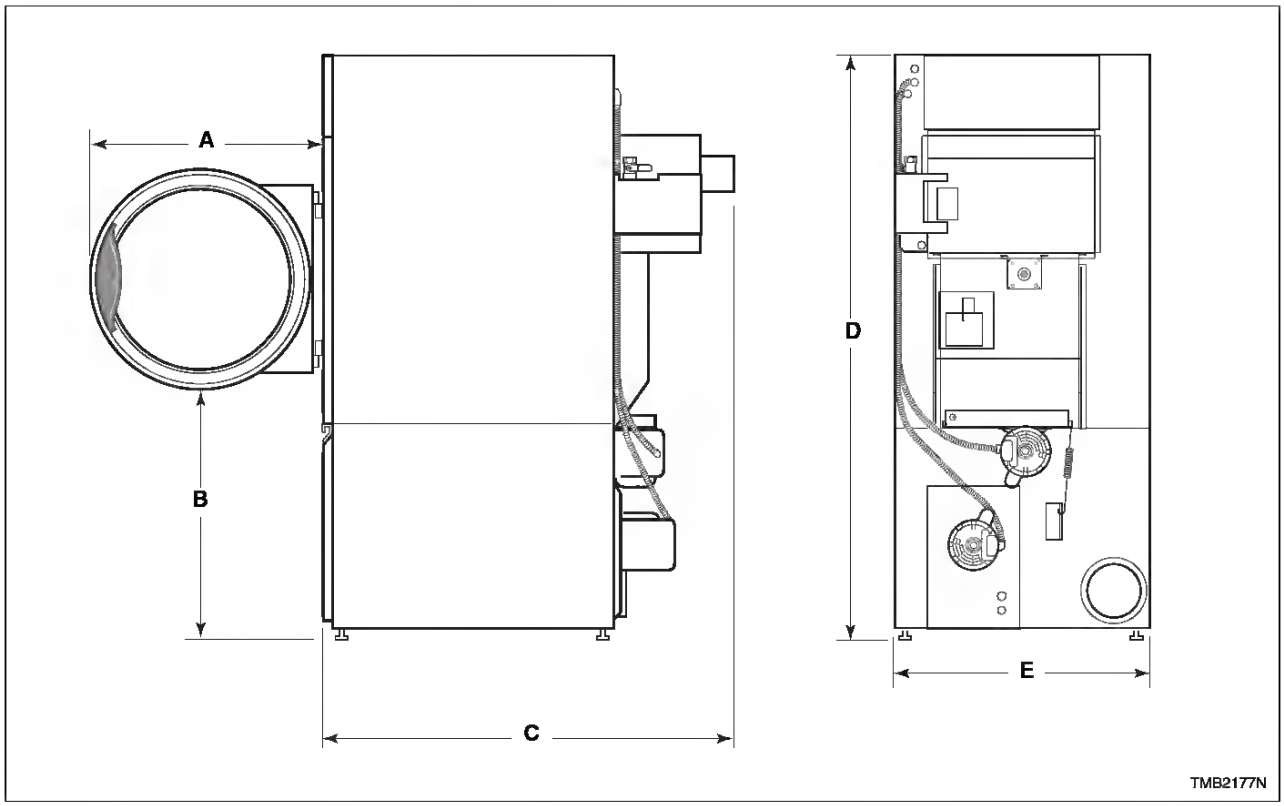
Cabinet Dimensions – 25, 30 and 35 Pound Models



Models	A	B	C	D	E
25 Pound	26.25 in. (667 mm)	27.5 in. (699 mm)	40.875 in. (1038 mm)	63.875 in. (1622 mm)	28 in. (711 mm)
30 Pound	26.25 in. (667 mm)	27.5 in. (699 mm)	46.875 in. (1191 mm)	63.875 in. (1622 mm)	28 in. (711 mm)
35 Pound	28 in. (711 mm)	27.5 in. (699 mm)	46.875 in. (1191 mm)	63.875 in. (1622 mm)	31.5 in. (800 mm)

NOTE: Facia panels available to increase height of single pocket models to 72.25 inches (1835 mm) and 76.25 inches (1938 mm).

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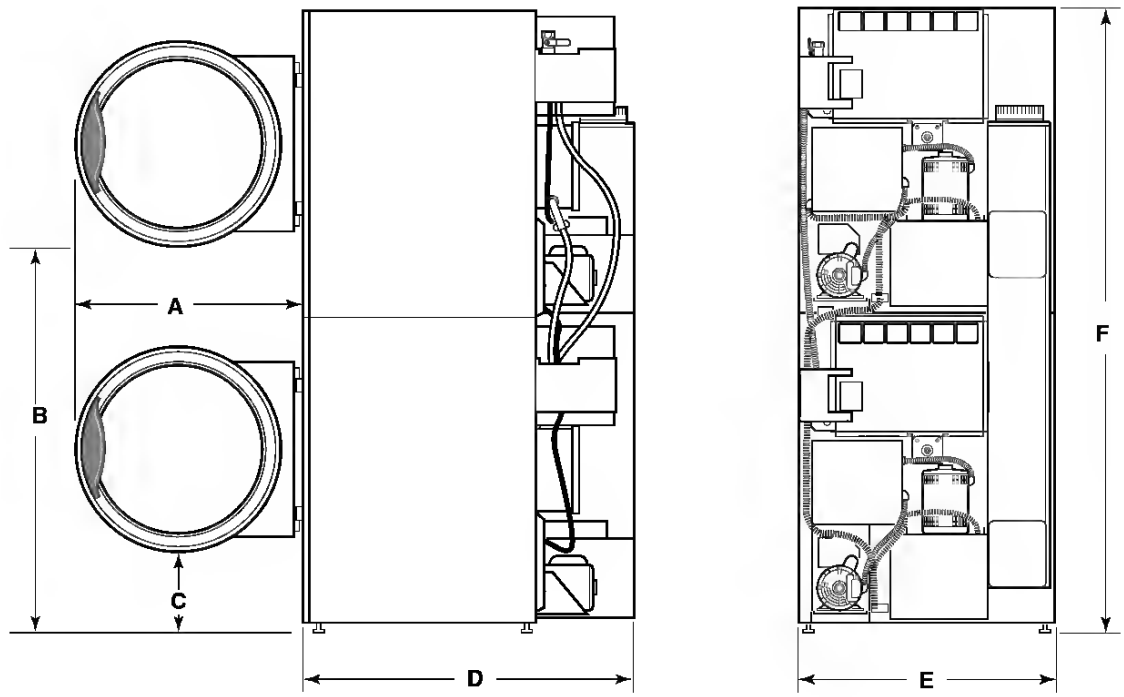
Cabinet Dimensions – T30



Models	A	B	C	D	E	F
T30	28 in. (711 mm)	48 in. (1219 mm)	10 in. (254 mm)	42.875 in. (1090 mm)	31.5 in. (800 mm)	76.25 in. (1937 mm)

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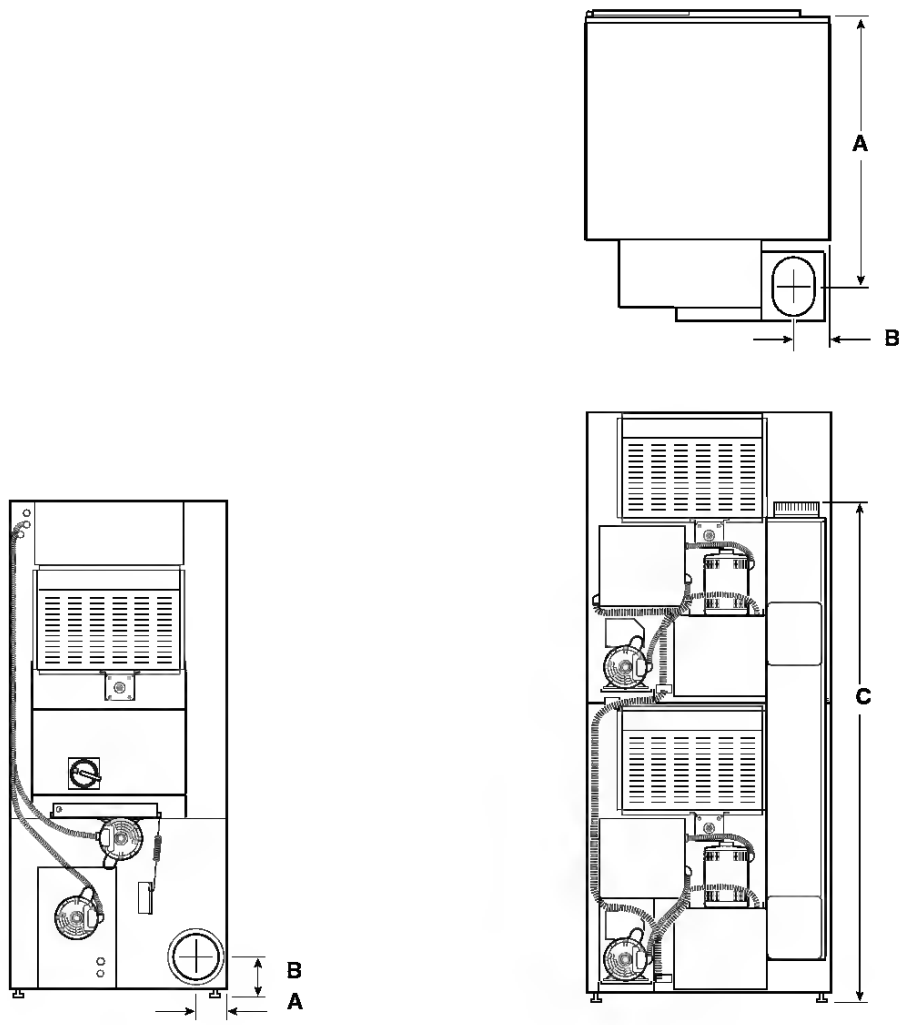
Exhaust Outlet Locations



25, 30 AND 35 POUND

T30

T4791

Models	Rear Exhaust			
	Diameter	A	B	C
25/30 Pound	6 in. (152 mm)	3.875 in. (99 mm)	4.625 in. (117 mm)	N/A
T30	Elliptical Fits 8 in. (203 mm)	35.75 in. (908 mm)	4.325 in. (110 mm)	64.25 in. (1632 mm)
35 Pound	8 in. (203 mm)	4.875 in. (124 mm)	5.625 in. (143 mm)	N/A

N/A = Not Applicable

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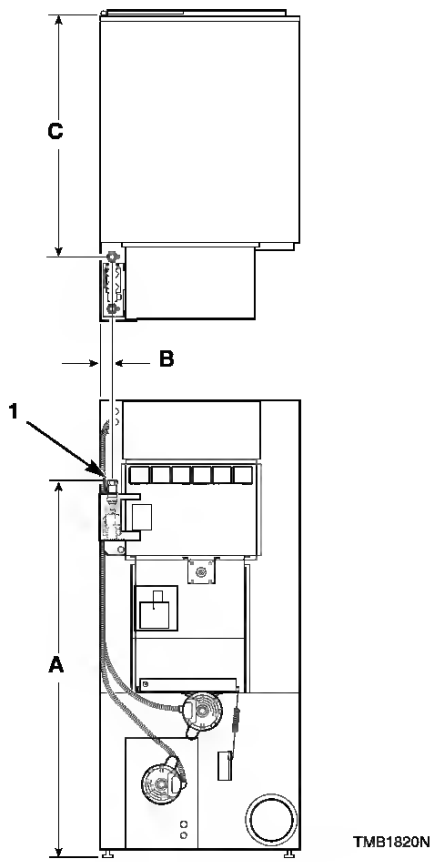
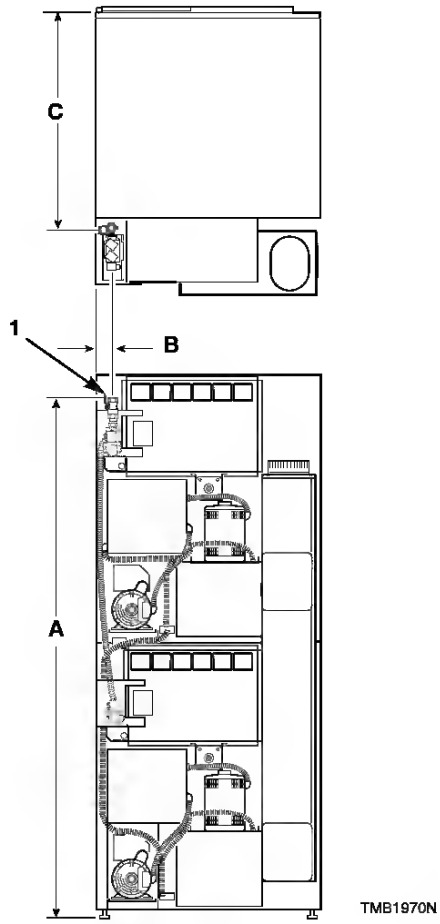
Gas Connection Locations



25, 30 AND 35 POUND



T30

1 1/2 in. NPT

Models	Gas Connection – CE and Australian Units		
	A	B	C
25 Pound	59 in. (1500 mm)	1.5 in. (38.1 mm)	29 in. (737 mm)
30 Pound	59 in. (1500 mm)	1.5 in. (38.1 mm)	35 in. (889 mm)
T30	76.25 in. (1936.8 mm)	2.5 in. (64 mm)	30.5 in. (775 mm)
35 Pound	59 in. (1500 mm)	2.5 in. (64 mm)	35 in. (889 mm)

Models	Gas Connection – Non-CE and Non-Australian Units		
	A	B	C
25 Pound	57 in. (1450 mm)	2.5 in. (64 mm)	35.5 in. (927 mm)
30 Pound	57 in. (1450 mm)	2.5 in. (64 mm)	43 in. (1092 mm)
T30	76 in. (1930.4 mm)	1.5 in. (38.1 mm)	37 in. (940 mm)
35 Pound	57 in. (1450 mm)	4 in. (101.6 mm)	43 in. (1092 mm)

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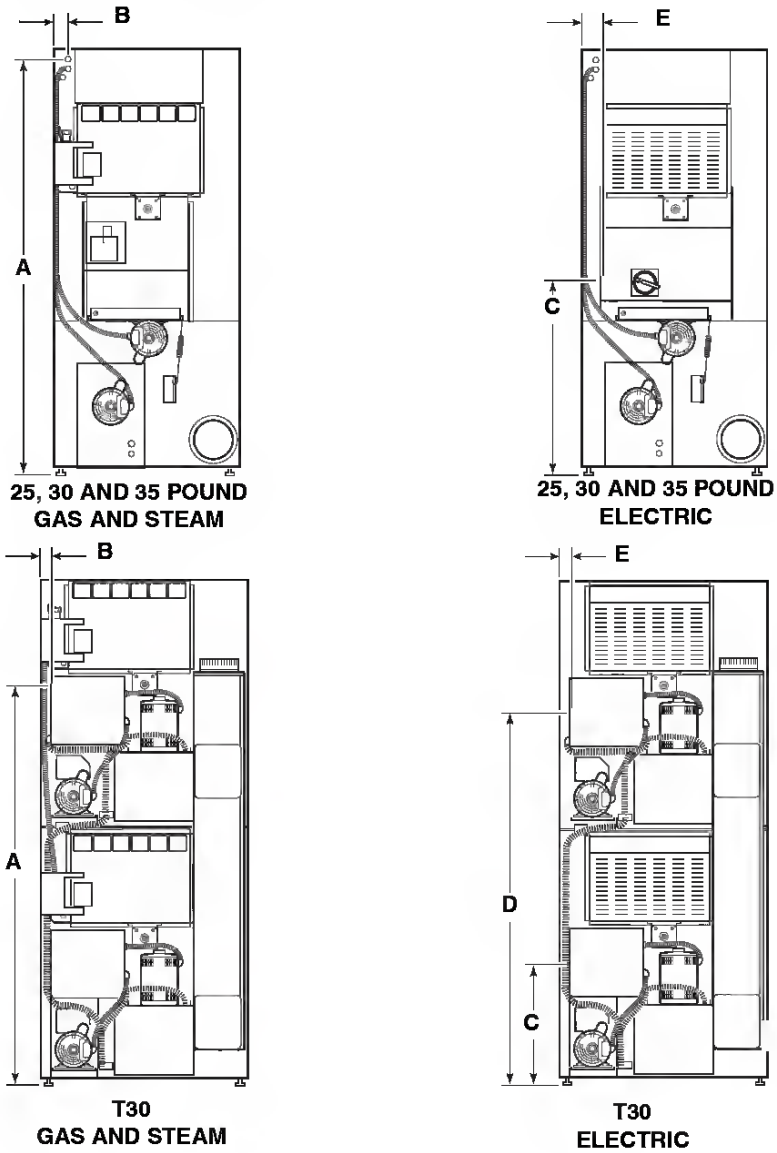
Electrical Connection Locations



Models	Electrical Service				
	Gas and Steam Models		Electric Models		
	A	B	C	D	E
25/30 Pound	62.25 in. (1581 mm)	2 in. (51 mm)	28 in. (711 mm)	N/A	3.25 in. (83 mm)
T30	57 in. (1448 mm)	2 in. (51 mm)	11.5 in. (292 mm)	48.5 in. (1232 mm)	7 in. (178 mm)
35 Pound	62.25 in. (1581 mm)	3 in. (76 mm)	28 in. (711 mm)	N/A	4.25 in. (108 mm)

N/A = Not Applicable

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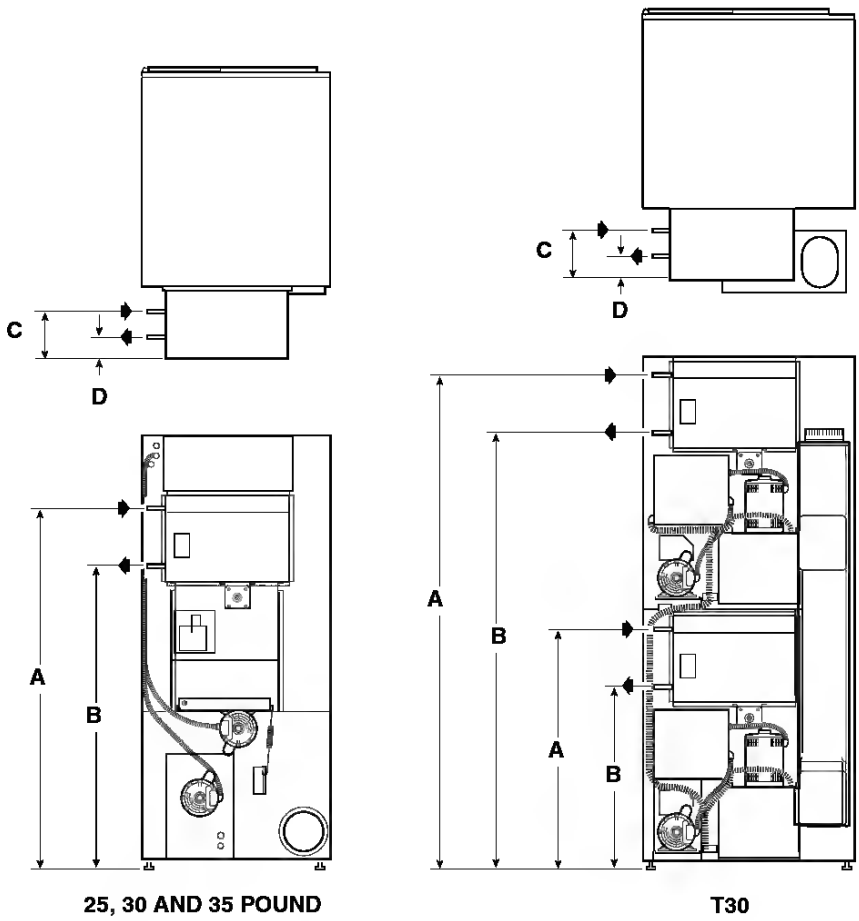
Steam Connection Locations



Models	Inlet		Outlet	
	A	C	B	D
25/30/35 Pound	53.75 in. (1365 mm)	7.8 in. (198 mm)	42.5 in. (1080 mm)	6.5 in. (165 mm)
T30 (Upper)	74.15 in. (1883 mm)	11.6 in. (295 mm)	62.9 in. (1598 mm)	10.25 in. (260 mm)
T30 (Lower)	36.6 in. (930 mm)	11.6 in. (295 mm)	25.3 in. (643 mm)	10.25 in. (260 mm)

NOTE: All connections use 3/4 inch NPT pipe.

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Notes

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Installation

Pre-Installation Inspection

Upon delivery, visually inspect crate carton and parts for any visible shipping damage. If the crate, carton, or cover is damaged or signs of possible damage are evident, have the carrier note the condition on the shipping papers before the shipping receipt is signed, or advise the carrier of the condition as soon as it is discovered.

Remove the crate and protective cover as soon as possible and check the items listed on the packing list. Advise the carrier of any damaged or missing articles as soon as possible. A written claim should be filed with the carrier immediately if articles are damaged or missing.

IMPORTANT: Warranty is void unless tumbler is installed according to instructions in this manual. Installation should comply witb minimum specifications and requirements detailed herein, and with applicable local gas fitting regulations, municipal building codes, water supply regulations, electrical wiring regulations, and any otber relevant statutory regulations. Due to varied requirements, applicable local codes should be thoroughly understood and all pre-installation work arranged for accordingly.

Material Required (Obtain Locally)	
All Models	One disconnect switch or circuit breaker.
Gas Models	One gas shut-off valve for gas service line to each tumbler.
Steam Models	One steam shut-off valve for steam service line to be connected upstream of solenoid steam valve. Steam shut-off valve for each condensate return line. Flexible steam hoses with a 125 psig (pounds per square inch gauge) (8.78 kg/sq. cm) working pressure for connecting steam coils. Refer to *Figure 15* for sizing and connection configurations. Steam trap for steam coil outlet to condensate return line. Optional – Vacuum breaker for condensate return line.

Location Requirements

Tbe tumbler must be installed on a level floor capable of supporting weight of tumbler fully loaded. Floor covering materials such as carpeting or tile should be removed.

To assure compliance, consult local building code requirements. The tumbler must not be installed or stored in an area where it will be exposed to water and/or weather.

IMPORTANT: DO NOT block the airflow at the rear of the tumbler with laundry or otber articles. Doing so would prevent adequate air supply to tbe combustion chamber of the tumbler.

A typical tumbler enclosure is shown in *Figure 1*. Note the minimum and maximum dimensions. Local codes and ordinances must be complied with.

WARNING

To reduce the risk of serious injury, install lockable door(s) to prevent public access to rear of tumblers.

W055

IMPORTANT: Install tumblers witb sufficient clearance for servicing and operation. Refer to *Figure 1*.

IMPORTANT: Keep tumbler area clear and free from combustible materials, gasoline and otber flammable vapors and liquids.

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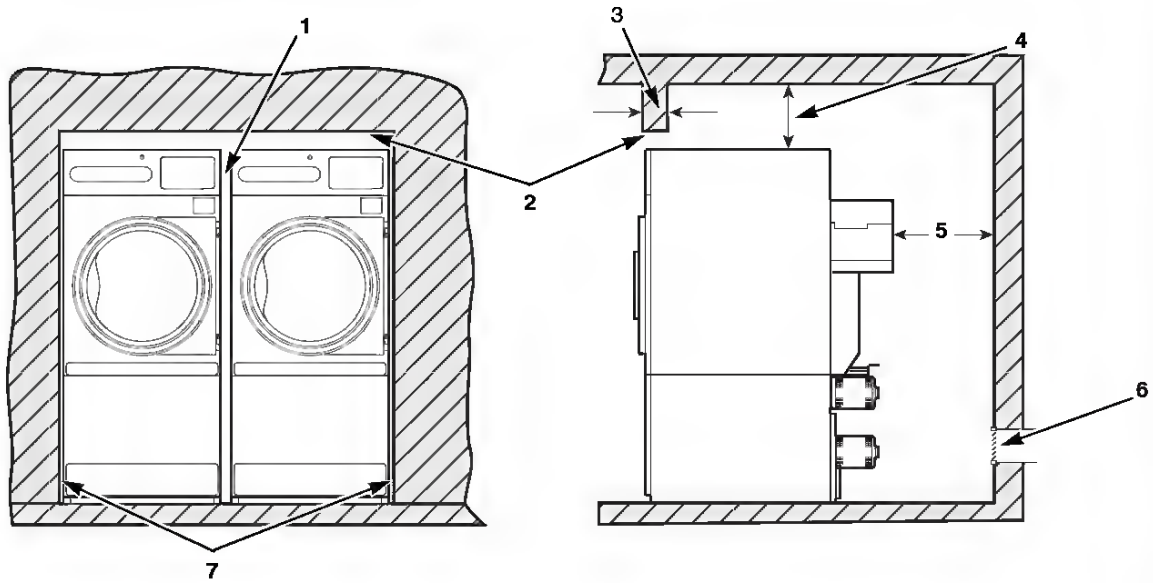
Tumbler Enclosure

WARNING

To reduce the risk of severe injury, clearance of tumbler cabinet from combustible construction must conform to the minimum clearances.

W056



TMB2021N

NOTE: Shaded areas indicate adjacent structure.

1	0.5 in. (13 mm) recommended between machines for removal or installations purposes.
2	Allow 2-4 in. (51-102 mm) opening at top of machine to aid in removal or installation. A removable trim piece may be used to conceal the opening; zero clearance allowed for trim.
3	4 in. (102 mm)
4	12 in. (305 mm) Minimum Clearance
5	24 in. (610 mm) minimum, 36 in. (914 mm) recommended for maintenance purposes.
6	Provision for make-up air: Minimum 1 square foot required per tumbler (2 square feet for stacked model). Location for reference only. May be anywhere behind tumbler.
7	0.25 in. (6 mm) recommended for removal or installation purposes, zero clearance allowed.

Figure 1

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Position and Level the Tumbler

Remove lint panel door, and unscrew the four shipping bolts (one at each corner). Remove tumbler from skid.

NOTE: Do not throw bolts away – they are the leveling legs.

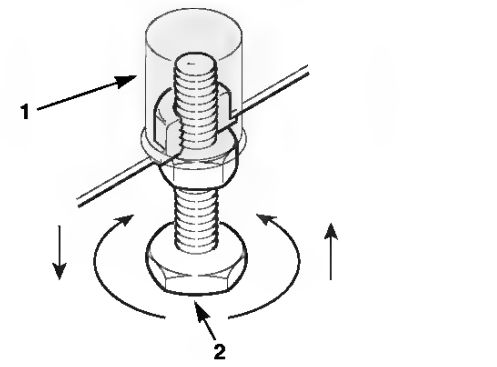
Remove four nuts from the literature packet, and screw one fully onto each leveling leg.

Screw the four leveling legs (bolts) back into the level adjusting fittings from the bottom.

Slide tumbler to its permanent location. Adjust the leveling legs until the unit is level within 0.125 inch (3.18 mm). Tumbler must not rock. Lock leveling legs with nuts installed.

NOTE: The front of the tumbler should be slightly higher than the rear (approximately 0.125 inch, 3.18 mm). This will prevent the clothes, while tumbling, from wearing on the door glass gasket.

IMPORTANT: Keep tumbler as close to floor as possible. The unit must rest firmly on floor so weight of tumbler is evenly distributed.



1 Plastic Cap
2 Leveling Leg

Figure 2

Stacked Tumblers Only:

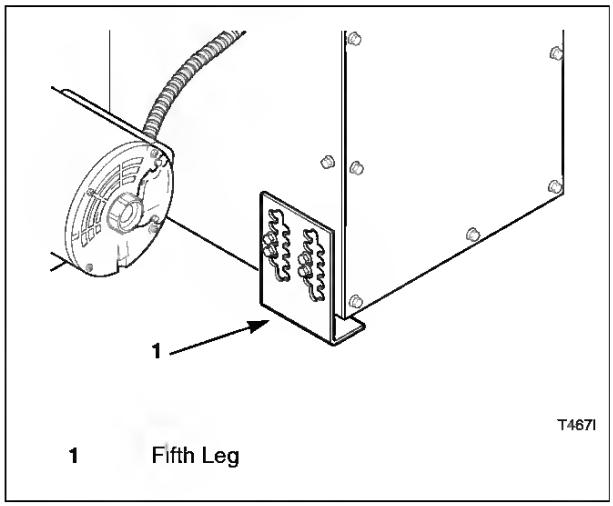
The stacked tumbler (T30) has a fifth leveling leg which is enclosed with this manual. It MUST BE installed on the lower left side of the blower housing to stabilize the tumbler. Refer to *Figure 3*.

After leveling with the four cabinet leveling legs, install the fifth so that it contacts the floor.

CAUTION

The stacked drying tumbler has a 5th leveling leg on the blower housing. It is very important to properly adjust this leg. Unit is back heavy and could rock or tip.

W250



1 Fifth Leg

Figure 3

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Installing Accessory Timing Cam

(Metered Models)

Coin Drop tumblers have eight accessory cams in the literature packet. These allow you to change your vending times. Refer to *Table 1*. Timer motor RPM is printed on the timer motor.

Cam Pins	1/30 RPM Timer Motor	1/60 RPM Timer Motor
2	15	30
3	10	20
4	7.5	15
5	6	12
6	5	10
8	3.75	7.5
10	3	6
12	2.5	5

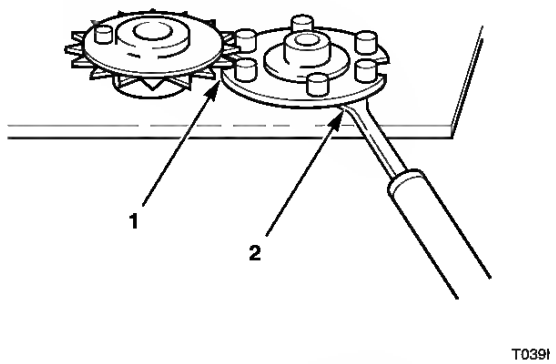
Table 1

Removal of Existing Timing Cam

1. Rotate cam by hand until "V" notch lines up beneath the ratchet tootb. Refer to *Figure 4*.
2. Insert narrow screwdriver under nylon cam, close to the clock shaft. Lift gently off shaft. Make sure that pressure is directed upward and that the "V" notch clears the ratchet tooth.

Installation of New Timing Cam

1. Insert drive into timing cam with wide prong in wide hole of cam.
2. Position timing cam and drive fork over the timer shaft, aligning the timer flat with the drive fork and the "V" notch with one of the ratchet teeth.
3. Press timing cam down firmly to seat timing cam onto the motor shaft.



1 Line up notch to clear ratchet tooth.
2 Lift gently with narrow blade.

Figure 4

4. Remove all accumulated time by turning cam counterclockwise until switch shuts off. Apply moderate clockwise pressure to fully seated timing cam and drive against the timing motor shaft. Meter must be advanced electrically for one cycle before an accurate measure of time can be made.

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Before Placing Tumbler into Service

1. Remove or open all panels, and check accessible bolts, nuts, screws, terminals and fittings for tightness.
2. Replace all panels and guards.
3. Turn on electrical supply to tumbler.
4. Open the supply valve for gas or steam heated tumblers.
5. After performing the previous checks, start the tumbler by pressing START. (Refer to the ***Operating Manual*** for detailed instructions.) Release the start button and open the loading door. The cylinder should stop rotating within seven seconds after the door is opened a maximum of 2 inches (51 mm). If it does not, adjust the loading door switch. Refer to ***Adjustments*** section.
6. **Gas Tumblers:** Start the tumbler and check the burner flame. Adjust the air inlet shutter as required. Refer to the ***Adjustments*** section.

IMPORTANT: The electronic ignition system will attempt to light the gas by sparking for the "trial for ignition" period. Refer to *Table 2*. If gas does not ignite within this period, the ignition control will go into a safety lockout and the valve will no longer open until the control is reset. It may be necessary to retry several times to bleed air from the gas lines. To reset, open and close the loading door and restart tumbler.

Location	Prepurge Time (seconds)	Trial for Ignition (seconds)	To Reset Lockout Condition:
CE and Australia	18	10	Press reset button on rear of machine
All others	1-3	10	Open loading door

Table 2

If lockout condition persists, check that the manual gas shut-off valve is in the "ON" position and that the gas service is properly connected. If condition still persists, remove tumbler from service.

7. Load the cylinder with a full load of clean rags and run to remove oil or dirt from cylinder.
8. Wipe out the cylinder using an all-purpose cleaner or detergent and water solution. Refer to *Figure 5*.

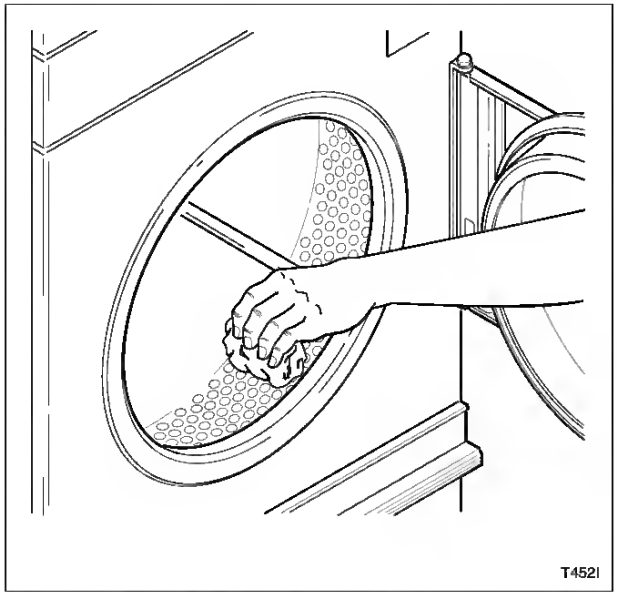

Figure 5

If the tumbler does not meet ANY of the listed requirements, remove tumbler from use. Refer to ***Removing Tumbler from Service*** section.

Required for CE Models Only

Once machine is installed, please be sure to complete the following items:

- Review and verify machine operation with customer.
- Leave all literature and a signed Declaration of Conformity with customer.
- Review machine warranty information with customer.
- Apply warning sticker on front panel of machine, in language appropriate to country of sale (included in literature packet).

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Installing CE Gas Drying Tumblers

WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/ panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

General Information

This information is to be used when installing gas tumblers in countries, and/or on gases, different than the machine's factory configuration. Tumblers are supplied from the factory for operation on Natural Gas 1000 Btu/cu ft. (8914 kcal/m^3), or L.P. Gas 2500 Btu/ cu ft. (22,250 kcal/m^3) in the countries of GB/IE/PT/ ES/IT/GR/LU/CH. To install machines in any other country, or on any other gas, requires some level of modification.

Orifices, stickers, block-open kits, regulator springs and other parts needed for conversions are to be ordered separately.

Models are built in two different configurations:

- **Regulated Natural Gas** – Injector is sized for Natural Gas, second family, group H (E) at 20 mbar inlet pressure. Regulator/governor is operational. Gas valve CAN be field-converted to a non-regulating type.
- **Unregulated L.P. (Liquefied Petroleum) Gas** – Injector is sized for L.P., third family, group 3+ at 28.37 mbar inlet pressure. Regulator/governor is blocked open. Gas valve CANNOT be field-converted to a regulating type.

Serial plates supplied from the factory are configured for the countries of GB/IE/PT/ES/IT/GR/LU/CH. These instructions pertain to the situations when the country of use or gas supply is different than that on the serial plate.

Table 3 describes the different gases that are available in different CE countries, and how the machines need to be configured to operate with those gases. In the CE, there are Natural Gases that do not allow for machine regulation, and L.P. Gases that must be regulated. For L.P. Gas, third family B/P at 50 mbar, order regulated Natural Gas machines and convert according to *Table 3*.

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Gases and Configurations

Country Code	Gas Type	Group	Supply Pressure, mbar	Injector Pressure, mbar	Capacity/ Model	Diameter, mm	Quantity	Injector Part No.
DK/NO/ SE/FI/CZ/ EE/LV/LT/ SI/SK	Natural Gas	H	20	7.6 8.0 8.0 8.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	B/P	30	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
DE**	Natural Gas	E	20	7.6 8.0 8.0 8.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	LL	30 and No Governor or 50* and 28*		25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
NL	Natural Gas	L	25	11.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	B/P	30	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
BE/FR*	Natural Gas	E+	20 or 25	No Governor	25 30 T30 35	3.9 3.3 3.3 3.7	1 1 2 1	M402980 M401021 M401021 M400998
	L.P. Gas	+	28 or 37	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361

Table 3 (continued)

Injector information at 0-2000 feet (0-600 meters) altitude.

* For Natural Gas, Group E+ applications, convert using L.P. Gas model and replace injectors.

** For L.P. Gas, Group B/P with 50 mbar supply pressure, convert using Natural Gas model, 431559 regulator spring kit and injectors.

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Table 3 (continued)

Country Code	Gas Type	Group	Supply Pressure, mbar	Injector Pressure, mbar	Capacity/ Model	Diameter, mm	Quantity	Injector Part No.
GB/IE/PT/ ES/IT/GR/ LU/CH	Natural Gas	H	20	7.6 8.0 8.0 8.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	+	28 or 37	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
AT**	Natural Gas	H	20	7.6 8.0 8.0 8.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	B/P	50**	28**	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
CY/IS/MT	L.P. Gas	B/P	30	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
HU	Natural Gas	H	25	7.6 8.0 8.0 8.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	B/P	30	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361
PL	Natural Gas	H	20	7.6 8.0 8.0 8.0	25 30 T30 35	3.9 4.0 4.0 4.6	1 1 2 1	M402980 M402992 M402992 M411511
	L.P. Gas	3P	37	No Governor	25 30 T30 35	2.1 2.2 2.2 2.5	1 1 2 1	M401003 M401011 M401011 M406361

Injector information at 0-2000 feet (0-600 meters) altitude.

* For Natural Gas, Group E+ applications, convert using L.P. Gas model and replace injectors.

** For L.P. Gas, Group B/P with 50 mbar supply pressure, convert using Natural Gas model, 431559 regulator spring kit and injectors.

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Basic Configuration

1. Determine the necessary conversion operations to convert from the factory-supplied configuration to the desired configuration.
2. Perform the conversions required so the machine is properly configured for the desired country and gas (refer to ***Specific Conversion Procedures*** section):
   - How to Convert Gas Valve from Regulated to Unregulated

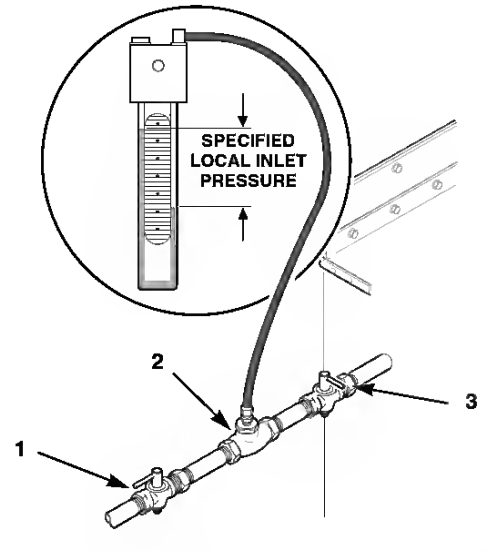
NOTE: Conversion from regulated to unregulated is only needed when regulated dryers were ordered, but unregulated dryers were needed.

   - How to Change Injector (Orifice) Size
   - How to Adjust Gas Valve Governor/Regulator
   - How to Change Regulator Spring, DE/AT Only
3. If applicable, peel off the appropriate country sticker (included with machine) and apply it to the serial plate over the existing country information.
4. If applicable, peel off the appropriate conversion sticker (included with machine) and apply it to the data plate over the "ADJUSTED FOR _____ GAS: _____" information.
5. Commission tumbler for use.

WARNING

When converting the tumbler to a different gas or pressure, first verify that the supply inlet pressure is equipped with a pressure regulator (located ahead of the tumbler) that will maintain the gas supply at the inlet pressure specified.

W430



1	Gas Shut-Off Valve (Ahead of pressure tap)
2	Pressure Tap
3	Gas Shut-Off Valve (Shown in closed position)

Figure 6

Specific Conversion Procedures

How to Convert Gas Valve from Regulated to Unregulated

Johnson GM7000 gas valve:

1. Disconnect electrical power from tumbler. Close gas shut-off valve to tumbler. Refer to *Figure 7*.
2. Follow instructions in Conversion Kit, Part No. 431485 (Jobnson Part No. GM-70 CBP).

NOTE: This kit does not contain any orifices.

3. Change injector size as required by the appropriate table according to ***How to Change Injector (Orifice) Size***.
4. For 025S Models, L.P. Gas only. Install 025S L.P. orifice plate (Part No. 70201901) onto gas valve bracket. Refer to *Figure 7*.
5. Commission tumbler for use.

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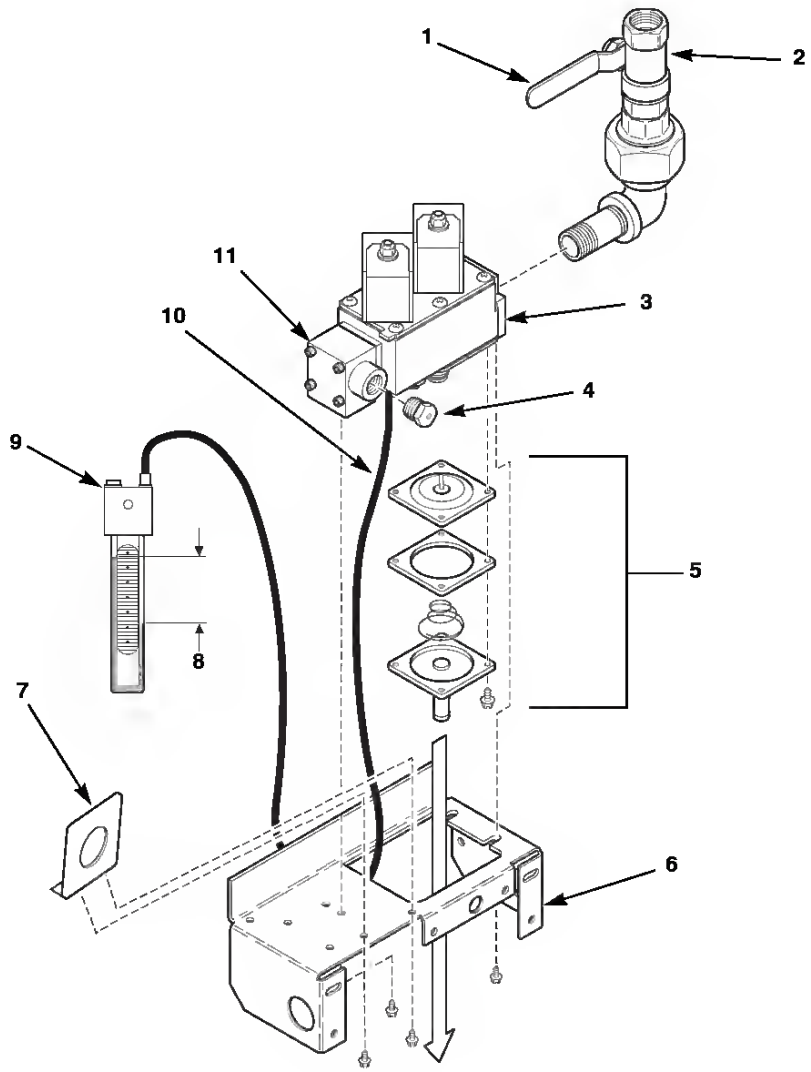

1	Gas Shut-Off Valve (Shown in closed position)	**7**	Part No. 70201901 025S L.P. Orifice Plate (For use on 025S Models L.P. only)
2	Shut-Off Valve	**8**	Required Orifice/Injector Pressure
3	Gas Valve	**9**	Manometer
4	Orifice/Injector	**10**	Connect Over Loosened Slotted Pressure Tap Screw in Bottom of Gas Valve
5	Regulator Adjusting Housing and Gasket (Regulated version shown)	**11**	Spud Holder
6	Gas Valve Bracket		

Figure 7

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How to Change Injector (Orifice) Size

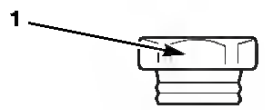
1. Disconnect electrical power from tumbler. Close gas shut-off valve to tumbler. Refer to *Figure 6*.
2. For Johnson GM7000 gas valve:

   Remove burner orifice(s) from the spud holder. Refer to *Figure 7*.
3. Install the new, correct injector(s) (orifices). Refer to *Figure 8*. Torque each to 9 – 10 Nm.
4. Commission tumbler for use.

NOTE: Blank injectors (orifices) are available as Part No. M400995.

How to Adjust Gas Valve Governor/Regulator

1. Check gas injector (manifold) pressure as follows. Refer to *Figure 7*.
2. Loosen screw plug inside pressure tap located on underside of valve.
3. Connect a "U"-tube manometer (or similar pressure gauge) to the tap.
4. Start tumbler and note pressure once flame is burning. Remove regulator cap and adjust regulator screw until the injector pressure per applicable table is achieved. Replace regulator cap and close needle valve (pressure tap).
5. Commission tumbler for use.



BURNER INJECTOR (ORIFICE)

TMB2015N

1 Size Stamped on Orifice

Figure 8

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Notes

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Exhaust Requirements

WARNING

A drying tumbler produces combustible lint. To reduce the risk of fire, the tumbler must be exhausted to the outdoors.

W057

To reduce the risk of fire and accumulation of combustible gases, DO NOT exhaust tumbler air into a window well, gas vent, chimney or enclosed, unventilated area such as an attic wall, ceiling, crawl space under a building, or concealed space of a building.

W059

Layout

Whenever possible, install tumblers along an outside wall where duct length can be kept to a minimum, and make-up air can be easily accessed. Elbows and long vents tend to increase drying time. Construction must not block the airflow at the rear of the tumbler. Doing so would prevent adequate air supply to the tumbler's combustion chamber.

Make-Up Air

A tumbler is forced air exhausted and requires provisions for make-up air to replace the air exhausted by the tumbler.

IMPORTANT: Do not obstruct the flow of combustion and ventilation air.

Make-up air openings should be as close to the tumbler(s) as possible.

The required make-up air opening to the outside for each tumbler is:

144 square inches (928 sq. cm) for 25, 30 and 35 pound tumbler models

288 square inches (1856 sq. cm) for T30 tumbler models

Make-up air openings with louvers will restrict airflow. The opening must be increased to compensate for area taken up by louvers.

Make-up air openings for a room containing tumbler(s) and/or gas fired hot water heater or other gravity vented appliances must be increased sufficiently to prevent downdrafts in any of the vents when all tumblers are in operation. Do not locate gravity vented appliances between tumbler(s) and make-up air openings. If it is necessary to duct make-up air to the tumbler(s), increase the area of the ductwork by 25% to compensate for any restriction in air movement.

Venting

For maximum efficiency and minimum lint accumulation, tumbler air must be exhausted to the outdoors by the shortest possible route.

Proper sized exhaust ducts are essential for proper operation. All elbows should be sweep type. Exhaust ducts must be assembled so the interior surfaces are smooth, so the joints do not permit the accumulation of lint. DO NOT use plastic or thin foil flexible ducts. Use exhaust ducts made of sheet metal or other noncombustible material. Use duct tape or pop-rivets on all seams and joints.

Verify that old ducts are thoroughly cleaned out before installing new tumbler.

WARNING

Improperly sized or assembled ductwork causes excess back pressure which results in slow drying, lint collecting in the duct, lint blowing back into the room, and increased fire hazard.

W355

NOTE: Exhaust ducts shall be constructed of sheet metal or other noncombustible material. Such ducts must be equivalent in strength and corrosion resistance to ducts made of galvanized sheet steel not less tban 0.0195 inches (0.495 mm) thick.

Where the exhaust duct pierces a combustible wall, ceiling, floor or partition the opening must be sized per local codes. The space around the duct may be sealed with noncombustible material. Refer to *Figure 9*.

IMPORTANT: For best performance provide an individual exhaust duct for each tumbler. Do not install a bot water beater in room containing tumblers. It is better to have the water heater in a separate room with a separate air inlet.

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Individual Venting

For maximum efficiency and performance, it is preferred to exhaust tumbler(s) individually to the outdoors.

IMPORTANT: At no point may the cross sectional area of installed venting be less than the cross sectional area of tbe exhaust outlet of the tumbler.

The exhaust duct must be designed so the static back pressure measured 12 inches (305 mm) from the exhaust outlet does not exceed the maximum allowable pressure specified on the installation sticker on the rear of the tumbler.

NOTE: Static back pressure must be measured with the tumbler running (both pockets on stacked models).

The maximum allowable length venting of the same diameter as the exhaust thimble is 14 feet (4.3 meters) and two 90° elbows or equivalent. If the equivalent length of a duct required for an installation exceeds the maximum allowable equivalent length, the diameter of a round duct must be increased by 10% for each additional 20 feet (6.1 meters). Cross section area of a rectangular duct must be increased by 20% for each additional 20 feet (6.1 meters). *Table 4* shows how to determine equivalent venting.

Duct Diameter	Equivalent Length of Straight Duct
6 in. (152 mm)	One 90° elbow = 7 ft. (2.1 m)
8 in. (203 mm)	One 90° elbow = 9.3 ft. (2.83 m)
10 in. (254 mm)	One 90° elbow = 11.6 ft. (3.5 m)
12 in. (305 mm)	One 90° elbow = 14 ft. (4.3 m)
14 in. (356 mm)	One 90° elbow = 16 ft. (4.9 m)
16 in. (406 mm)	One 90° elbow = 18.7 ft. (5.7 m)
18 in. (457 mm)	One 90° elbow = 21 ft. (6.4 m)
Equivalent Length (feet) = 1.17 x Duct Diameter (inches)	

Table 4

Example: A 12 incb (305 mm) diameter duct's equivalent length of 14 feet (4.3 m) of duct and two 90° elbows is:

Equivalent Lengtb = 14 feet + (2) 90° elbows
= 14 feet + 14 feet + 14 feet
= 42 feet (12.8 meters)

With the tumbler (both pockets on stacked models) in operation, airflow at any point in the duct should be at least 1200 feet per minute (366 meters per minute) to ensure that lint remains airborne. If 1200 feet per minute cannot be maintained, schedule a regular inspection and cleaning of the ductwork.

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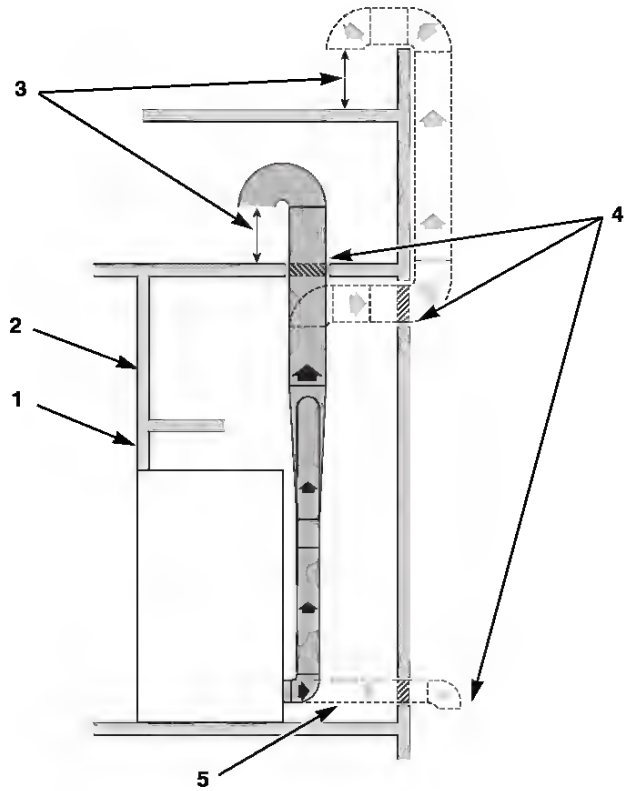

TMB2103N

1	Removable strip of panel in framing wall to permit removal of tumbler from framing wall
2	Partition or bulkhead
3	Minimum distance between exhaust opening and roof, ground or other obstruction: 36 in. (914 mm)
4	2 in. (51 mm) minimum clearance on both sides of duct
5	Exhaust airflow – maximum length of duct: 14 ft. (4.3 m)

Figure 9

NOTE: Do not install wire mesb or screen in exbaust duct opening to avoid lint build-up or impacting proper discharge of air from tumblers.

NOTE: Where exhaust duct pierces a combustible wall or ceiling, the opening must be sized per local codes.

NOTE: Inside of duct must be smooth. Do not use sbeet metal screws to join sections.

Consult your local building code for regulations which may also apply.

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Manifold Venting

While it is preferable to exhaust tumblers individually to the outdoors, a main collector duct may be used if it is sized according to *Figure 11*. This illustration indicates minimum diameters, which should be increased if the collector length exceeds 14 feet (4.3 meters) and two 90° elbows. The diameter of a round duct must be increased by 10% for each additional 20 feet (6.1 meters). Cross sectional area of a rectangular or square duct must be increased 20% for each additional 20 feet (6.1 meters). Refer to *Table 4* to determine equivalent ducting sizing. The collector duct may be rectangular or square in cross section, as long as the area is not reduced. Provisions **MUST** be made for lint removal and cleaning of the collector duct.

The vent collector system must be designed so the static back pressure measured 12 inches (305 mm) from the exhaust outlet does not exceed the maximum allowable pressure specified on the installation sticker on the rear of tumbler. Static back pressure must be measured with all tumblers vented into the collector operating.

NOTE: Never connect a tumbler duct at a 90° angle to tbe collector duct. Refer to *Figure 10*. Doing so will cause excessive back pressure, resulting in poor performance. Never connect two tumbler exhaust ducts directly across from each other at tbe point of entry to the collector duct.

With the tumbler (both pockets on stacked models) in operation, airflow at any point in the duct should be at least 1200 feet per minute (366 meters per minute) to ensure that lint remains airborne. If 1200 feet per minute cannot be maintained, schedule a regular inspection and cleaning of the ductwork.

The collector system must be designed so the static back pressure measured 12 inches (305 mm) from the exhaust outlet does not exceed the maximum allowable pressure specified on the installation sticker on the rear of tumbler. This must be measured with all tumblers vented into the collector operating.

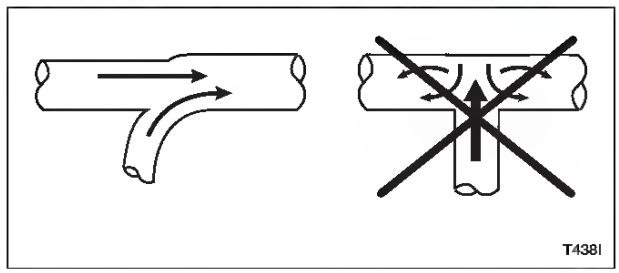

Figure 10

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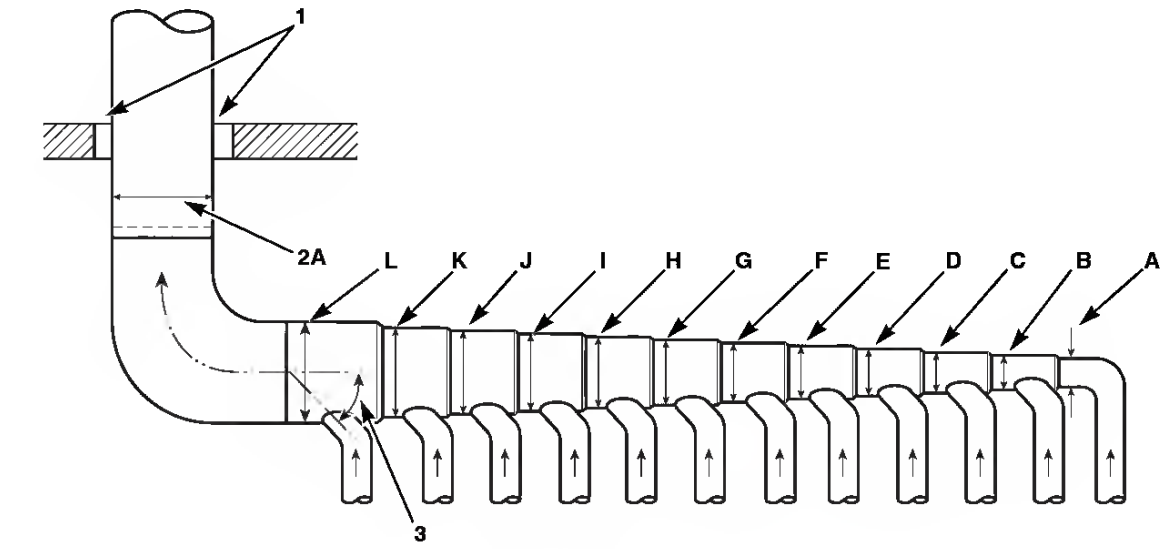
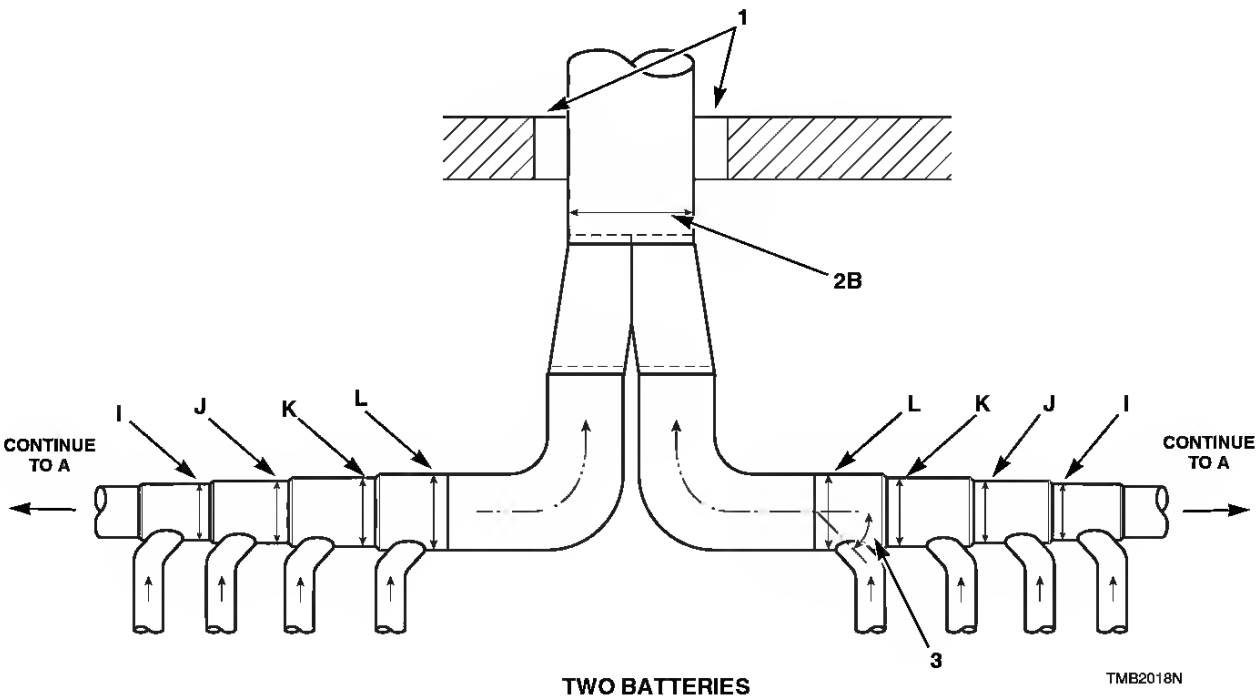


ONE BATTERY SAME AS LARGEST STATION USED

TMB2019N



TWO BATTERIES

TMB2018N

1	**NOTE: Where the exhaust duct pierces a combustible wall or ceiling, the opening must be sized per local codes.**	2A	Outlet Duct Diameter for One Battery
		2B	Outlet Duct Diameter for Two Batteries
		3	45° Typical

Figure 11

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Exhaust Requirements

Duct Station	25 and 30 Pound		T30 and 35 Pound	
	6 in. (152 mm) Duct		8 in. (203 mm) Duct	
	2A	2B	2A	2B
A	7 in. (178 mm)	10 in. (254 mm)	9 in. (229 mm)	12 in. (305 mm)
B	10 in. (254 mm)	15 in. (381 mm)	12 in. (305 mm)	17 in. (432 mm)
C	12 in. (305 mm)	18 in. (457 mm)	15 in. (381 mm)	22 in. (559 mm)
D	14 in. (356 mm)	20 in. (508 mm)	17 in. (432 mm)	25 in. (635 mm)
E	16 in. (406 mm)	23 in. (584 mm)	19 in. (483 mm)	27 in. (686 mm)
F	18 in. (457 mm)	26 in. (660 mm)	21 in. (533 mm)	30 in. (762 mm)
G	19 in. (483 mm)	27 in. (686 mm)	23 in. (584 mm)	33 in. (838 mm)
H	20 in. (508 mm)	29 in. (737 mm)	24 in. (610 mm)	34 in. (864 mm)
I	22 in. (559 mm)	32 in. (813 mm)	26 in. (660 mm)	37 in. (940 mm)
J	23 in. (584 mm)	33 in. (838 mm)	27 in. (686 mm)	39 in. (991 mm)
K	24 in. (610 mm)	34 in. (864 mm)	28 in. (711 mm)	40 in. (1016 mm)
L	25 in. (635 mm)	36 in. (914 mm)	30 in. (762 mm)	43 in. (1092 mm)

Table 5

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Gas Requirements

WARNING

To reduce the risk of fire or explosion, DO NOT CONNECT THE GAS LINE TO THE TUMBLER IF THE GAS SERVICE IS NOT THE SAME AS THAT SPECIFIED ON THE TUMBLER SERIAL PLATE! It will first be necessary to convert the gas burner orifice and gas valve. Appropriate conversion kits are available.

W060

IMPORTANT: Any product revisions or conversions must be made by the Manufacturer's Authorized Dealers, Distributors, or local service personnel.

IMPORTANT: The tumbler must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 0.5 psig (3.45 kPa, 34.5 mbar).

IMPORTANT: The tumbler and its manually operated appliance gas valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 0.5 psi (3.45 kPa, 34.5 mbar).

IMPORTANT: The installation must comply with local codes or, in the absence of local codes:

- **with the latest edition of the "National Fuel Gas Code," ANSI Z223.1/NFPA 54 in the U.S.A.,**
- **with CAN1-B149.1 or Natural Gas and Propane Installation Code in Canada,**
- **and Australian Gas Association/Australian L.P. Gas Association requirements in Australia.**

Obtain specific gas service pipe size from the gas supplier. Refer to *Table 6* for general pipe size.

The following must be furnished and installed by the customer for the gas service line to each tumbler. Refer to *Figure 12*.

- Sediment traps
- Shut-off valves
- Supply pressure taps

It is important that equal pressure be maintained at all tumbler gas connections. This can best be done by installing a one inch (25 mm) pipe gas loop. Refer to *Figure 13*.

WARNING

To reduce the risk of fire or explosion, if the tumbler is to be connected to Liquefied Petroleum (L.P.) gas, a vent to the outdoors must be provided in the room where the tumbler is installed.

W062

NATURAL GAS service must be supplied at 7 ± 1.5 inch water column pressure (17.4 ± 4 mbar, 1.74 ± 0.37 kPa). An in-line pressure regulator may be required on Natural Gas models if the line pressure exceeds 8 water column inches (2.0 kPa) pressure with all gas appliances firing.

LIQUID PETROLEUM GAS (L.P.) service must be supplied at 11 ± 0.3 water column inches (27 ± 1 mbar, 2.74 ± 0.07 kPa) with all gas appliances running (tumblers, water heaters, space heaters, furnace, etc.).

For converting Non-CE models from Natural Gas to L.P. Gas:

25 Pound – M4699P3
30 Pound – M4703P3
T30 – M4707P3
35 Pound – M4711P3

CE GASES refer to ***Installing CE Gas Drying Tumblers*** section, the above data does not apply to the CE.

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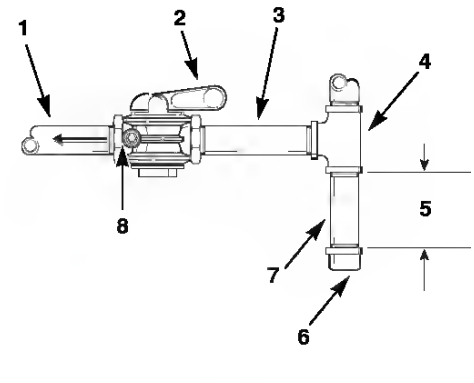
Turn on gas and check all pipe connections (internal and external) for gas leaks with a non-corrosive detection fluid. Purge air in gas service line by operating the tumbler in the drying mode. If burner does not light and unit goes into lockout, open and close the door and restart. Repeat these steps until burner ignites. **Use pipe compound, resistant to actions of L.P. Gas, on all pipe threads.**

WARNING

Check all pipe connections, internal and external, for gas leaks using a non-corrosive leak detection fluid. To reduce the risk of explosion or fire, DO NOT USE AN OPEN FLAME TO CHECK FOR GAS LEAKS! Gas connections should be checked twice a year for leakage.

W635



1	Gas Line to Tumbler Controls
2	Shut-Off Valve
3	Gas Supply Piping System
4	Gas "T" Fitting
5	6 in. (152 mm) Minimum Gas Pipe
6	Gas Pipe Cap
7	Dirt and Water Vapor Trap
8	Supply Pressure Tap

Figure 12

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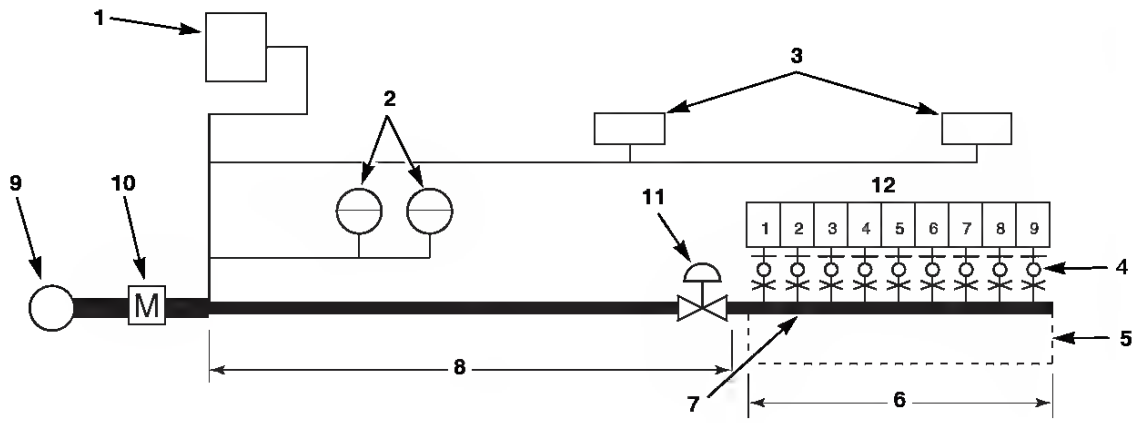
Gas Supply Pipe Sizing and Looping



1	Gas Furnace (120,000 Btu/hr)	**8**	25 ft. (7.6 m)
2	Gas Water Heaters (400,000 Btu/hr each)	**9**	Main Regulator
3	Gas Space Heaters (70,000 Btu/hr each)	**10**	Gas Meter
4	Sediment Traps, Supply Pressure Taps and Shut-Off Valves. Refer to *Figure 12*.	**11**	Pressure Regulator (If required)
5	1 in. (25.4 mm) Pipe for Gas Loop	**12**	25 Pound Tumblers (64,000 Btu/hr each) 30 Pound Tumblers (73,000 Btu/hr each) T30 Tumblers (73,000 Btu/hr each) 35 Pound Tumblers (90,000 Btu/hr each)
6	19 ft. (5.8 m)		
7	Minimum pipe size to tumbler is 0.5 in. (12.7 mm).		

SAMPLE CALCULATIONS:

Equivalent length = Total length of main gas supply pipe to the far end of the tumblers.
= 25 ft. + 19 ft. (7.6 m + 5.8 m) gas supply pipe
= 44 ft (13.4 m) Total Gas Line

Total Btu/hr = The sum of the Btu/hr of all 30 pound tumblers being fed by the main gas supply pipe.
= 9 x 73,000
= 657,000 Btu/hr

Using *Table 6*, the main supply pipe diameter should be 2 in. (51 mm).

IMPORTANT: Gas pipe loop must be installed as illustrated to equalize gas pressure for all tumblers connected to single gas service. Other gas using appliances should be connected upstream from loop.

Figure 13

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Gas Appliances Total Btu/hr	Gas Pipe Size Required for 1000 Btu Natural Gas — 0.64 Specific Gravity at 7 ± 1.5 inches (17.4 ± 4 mbar, 1.74 ± 0.37 kPa) Water Column Pressure					
	Equivalent Length					
	25 feet (7.63 m)	50 feet (15.25 m)	75 feet (22.88 m)	100 feet (30.50 m)	125 feet (38.13 m)	150 feet (45.75 m)
	Based on 0.3 in. Water Column Pressure Drop for Length Given Sizes shown in inches (mm)					
100,000	0.75 (19.05)	0.75 (19.05)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)
120,000	0.75 (19.05)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)
140,000	0.75 (19.05)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)	1.25 (31.75)
160,000	0.75 (19.05)	1 (25.40)	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.25 (31.75)
180,000	1 (25.40)	1 (25.40)	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.25 (31.75)
200,000	1 (25.40)	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.25 (31.75)	1.5 (38.10)
300,000	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.5 (38.10)	1.5 (38.10)	1.5 (38.10)
400,000	1.25 (31.75)	1.25 (31.75)	1.5 (38.10)	1.5 (38.10)	1.5 (38.10)	2 (50.80)
500,000	1.25 (31.75)	1.5 (38.10)	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)
600,000	1.5 (38.10)	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)	2 (50.80)
700,000	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)
800,000	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)
900,000	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,000,000	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,100,000	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,200,000	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,300,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	3 (76.20)
1,400,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)
1,500,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)
1,600,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)
1,700,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)
1,800,000	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3 (76.20)
1,900,000	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3 (76.20)
2,000,000	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3.5 (88.90)
2,200,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)
2,400,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)
2,600,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)	3.5 (88.90)
2,800,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)	3.5 (88.90)
3,000,000	2.5 (63.50)	3 (76.20)	3.5 (88.90)	3.5 (88.90)	3.5 (88.90)	4 (101.60)

For L.P. Gas, correct the total Btu/hr by multiplying it by 0.6. The answer is the equivalent Btu on the above chart.

The installation must conform with local codes or, in the absence of local codes:

- **with the latest edition of the "National Fuel Gas Code," ANSI Z223.1/NFPA 54 in the U.S.A.,**
- **with CSA-B149.1 or Natural Gas and Propane Installation Code in Canada,**
- **and Australian Gas Association/Australian L.P. Gas Association requirements in Australia.**

Table 6

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High Altitude Orifice Sizing

For proper operation at altitudes above 2000 feet (610 m), the gas orifice size must be reduced to ensure complete combustion. Refer to *Table 7*.

For CE models, consult local gas supplier.

Model	Gas	Altitude		Orifice					New Rate
		feet	meters	#	inches	mm	Quantity	Part No.	(Btu/hr)*
25 Pound	Natural Gas	2001-4000	610-1220	26	0.1470	3.7	1	M401000	58,880
		4001-6000	1221-1830	27	0.1440	3.7		M400998	53,760
		6001-8000	1831-2440	28	0.1405	3.6		M401014	48,640
		8001-10,000	2441-3050	29	0.1360	3.4		M400997	43,520
	L.P. Gas	2001-6000	610-1830	43	0.0890	2.3		M406184	58,880
		6001-8000	1831-2440	44	0.0860	2.2		M401011	48,640
		8001-10,000	2441-3050	46	0.0810	2.1		M401003	43,520
30 Pound	Natural Gas	2001-4000	610-1220	22	0.1570	4.0	1	M402996	67,160
		4001-6000	1221-1830	24	0.1520	3.9		M402980	61,320
		6001-8000	1831-2440	26	0.1470	3.7		M401000	55,480
		8001-10,000	2441-3050	28	0.1405	3.6		M401014	49,640
	L.P. Gas	2001-6000	610-1830	42	0.0935	2.4		M403017	67,160
		6001-8000	1831-2440	43	0.0890	2.3		M406184	55,480
		8001-10,000	2441-3050	44	0.0860	2.2		M401011	49,640
T30	Natural Gas	2001-4000	610-1220	22	0.1570	4.0	2	M402996	134,320
		4001-6000	1221-1830	24	0.1520	3.9		M402980	122,640
		6001-8000	1831-2440	26	0.1470	3.7		M401000	110,960
		8001-10,000	2441-3050	28	0.1405	3.6		M401014	99,280
	L.P. Gas	2001-6000	610-1830	42	0.0935	2.4		M403017	134,320
		6001-8000	1831-2440	43	0.0890	2.3		M406184	110,960
		8001-10,000	2441-3050	44	0.0860	2.2		M401011	99,280
35 Pound	Natural Gas	2001-4000	610-1220	17	0.1730	4.4	1	M411374	82,800
		4001-6000	1221-1830	18	0.1695	4.3		M402988	75,600
		6001-8000	1831-2440	20	0.1610	4.1		M401002	68,400
		8001-10,000	2441-3050	22	0.1570	4.0		M402996	61,200
	L.P. Gas	2001-4000	610-1220	38	0.1015	2.6		M411376	82,800
		4001-6000	1221-1830	39	0.0995	2.5		M401007	75,600
		6001-8000	1831-2440	41	0.0960	2.4		M401015	68,400
		8001-10,000	2441-3050	42	0.0935	2.4		M403017	61,200

*Btu/hr derate of 4% per 1000 feet (305 meters) of altitude.

Table 7

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Notes

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Electrical Requirements

WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/ panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

To reduce the risk of fire and electric shock, check with a qualified serviceman for proper grounding procedures. Improper connection of the equipment grounding conductor may result in a risk of electric shock.

W068

To reduce the risk of fire and electric shock, if electrical supply is coming from a three phase service, DO NOT connect a "High Leg" or "Stinger Leg" to a single phase machine. On a three phase machine, if there is a "High Leg" or "Stinger Leg" it should be connected to L3.

W069

Grounding Instructions

NOTE: To ensure protection against shock, this tumhler MUST he electrically grounded in accordance with the local codes or, in the ahsence of local codes, with the latest edition of the National Electrical Code ANSI/NFPA No. 70. In Canada the electrical connections are to he made in accordance with CSA C22.1 latest edition Canadian Electrical Code, Part I, and/or local codes.

This tumbler must be grounded. In the event of malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current. This tumbler must be connected to a grounded metal, permanent wiring system; or an equipment grounding conductor must be run with the circuit conductors and connected to the appropriate ground location.

- Metal conduit and/or BX cable is not considered ground.
- Connecting the Neutral from the electrical service box to the tumbler ground screw does not constitute a ground.
- A dedicated ground conduit (wire) must be connected between the electrical service box ground bar and the tumbler ground screw.

WARNING

All electrical connections should be made by a qualified electrician.

To reduce the risk of electrical shock, de-energize the electrical circuit being connected to the tumbler before making any electrical connections. Never attempt to connect a live circuit.

W070

CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

W071

For CE Models Only

All manually operated models are factory-equipped with an emergency stop button on the front panel. If the emergency stop function is desired on coin-operated models, an external emergency stop button may be installed as specified on the machine wiring diagram.

NOTE: Activation of the emergency stop hutton stops all machine control circuit functions, hut DOES NOT remove all electrical power from machine.

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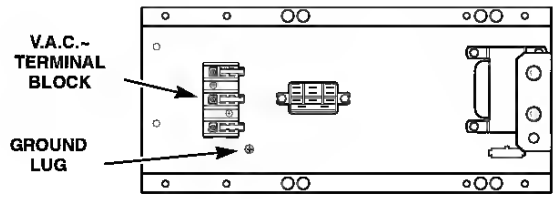
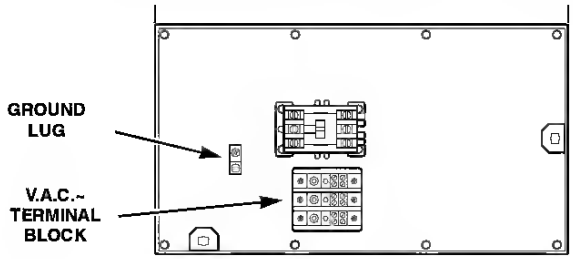
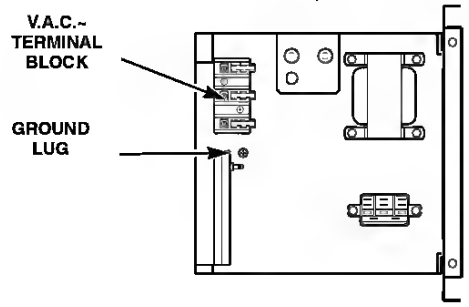
Service/Ground Location

Model	Heat Source	Ground Lug and Terminal Block Locations
25, 30 and 35 Pound	Gas or Steam	**CONTROL TRAY**  T474I
25, 30 and 35 Pound	Electric	**ACCESSORY BOX (LOCATED BELOW CONTROL TRAY)**  **NOTE: Do not make service connections in control tray area!** T475I
T30	Gas or Steam	**JUNCTION BOX, UPPER UNIT ONLY**  T476I
T30	Electric	**Junction box, upper and lower units (each unit must be wired separately).**

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Connecting Electrical Service

The following steps outline the procedure for connecting electrical service to the tumbler.

- **3 Phase Models – Each tumbler must be connected to its own individual branch circuit breaker, not fuses, to avoid the possibility of "single phasing" and causing premature failure of the motor(s).**
- **Electrical service must be connected using the appropriate permanent rigid metal conduit system.**
- **Service conductors must be copper only.**

For an existing service, determine your service voltage and conductor amperage. Carefully review the tumbler serial plate ratings and ***Electrical Requirements*** section of this manual. If service is inadequate it must be upgraded by a qualified electrical contractor. Never connect an improper or inadequate service to any machine.

Configuring Your Tumbler for Other Service Voltages

Several gas and steam tumbler models have been designed to be field convertible to other service voltages. Refer to *Table 8* for these models:

If your Serial Plate voltage is:	Your tumbler can be converted to the following voltages:
120 Volt/60 Hertz/ 1 Phase	208-240 Volt/60 Hertz/ 1 Phase
200-220 Volt/60 Hertz/ 1 Phase	100 Volt/60 Hertz/ 1 Phase
200 Volt/50 Hertz/ 1 Phase	100 Volt/50 Hertz/ 1 Phase
240 Volt/60 Hertz/ 3 Phase	200-208 Volt/60 Hertz/ 3 Phase
380 Volt/50 Hertz/ 3 Phase	400-415 Volt/50 Hertz/ 3 Phase

Table 8

NOTE: Electric models are not field convertible and must be connected to service specified on serial plate.

If tumbler requires conversion for use on another service voltage, complete the steps detailed in the ***Conversion Instructions*** section **prior to connecting service to machine**.

If tumbler does not require conversion or has been converted according to the ***Conversion Instructions*** section of this manual, continue with step 1.

NOTE: The wiring diagram is located inside the junction or contactor box.

1. For new service, install a circuit breaker or fused disconnect of proper voltage and current rating as close to each tumbler as possible.
2. Route service conduit from service breaker panel or disconnect panel to tumbler service connection box. Conduit routing should not obstruct access for maintenance or servicing. Refer to ***Service/ Ground Location***.
3. Pull conductors through conduit and attach to circuit breaker and ground connection. Secure service ground wire to the grounding screw or lug. Attach service conductors to appropriately labeled positions on the terminal block. Make sure all connections are secure.
4. Complete ferrite installation instructions for all gas and steam OPL Micro models.
5. Check electrical service phase sequence (3 Phase models only) as follows:
   a. Energize the electrical service and momentarily start the tumbler. Check the direction of cylinder rotation. If the cylinder rotates clockwise as viewed from the front, the phase sequence is correct. If the cylinder rotates counterclockwise, proceed with step b.
   b. Disconnect power to machine, disconnect and reverse the L1 and L2 connections on the terminal block.

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Stacked Tumbler Electrical Connections

All gas and steam stacked tumblers require a single service connection to TB1 of the upper unit junction box only. The serial plate reflects current draw, breaker/fuse size and conductor amperage required for the entire machine.

All electric heated stacked tumblers require separate service connections for each upper and lower unit. Serial Plate ratings reflect current draw, breaker/fuse size and conductor amperage required per unit.

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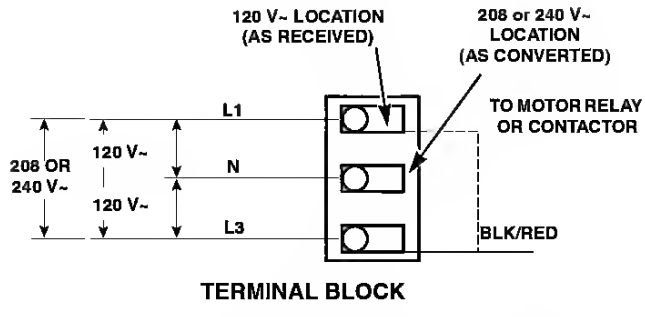
Conversion Instructions

If serial plate voltage is:	Tumbler can be converted to the following voltages:
120 Volt/60 Hertz/ 1 Phase **2W&G**	**208-240 Volt/60 Hertz/1 Phase Models:** **3W&G** 1. Prior to connecting service, locate the black/red wire which runs between terminal block and the motor relay or contactor. Refer to figure below.  TERMINAL BLOCK T381I 2. Disconnect the black/red lead from L1 of the terminal block and connect to L2 of the terminal block. For stacked tumbler complete steps 1 and 2 for upper and lower junction box areas. 3. Sign and date conversion sticker located on back of tumbler. 4. Follow the instructions covered in ***Connecting Electrical Service*** section.
240 Volt/60 Hertz/ 3 Phase **3W&G**	**200-208 Volt/60 Hertz/3 Phase Models:** **3W&G** 1. Prior to connecting electric service, locate transformer configuration jumper in junction box area. 2. Remove the 240 Volt jumper and replace it with the 208 Volt jumper located in the literature packet in cylinder. 3. For stacked tumblers, repeat steps 1 and 2 for each upper and lower unit. 4. Sign and date conversion sticker located on back of tumbler. 5. Follow the instructions covered in ***Connecting Electrical Service*** section.

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If serial plate voltage is:	Tumbler can be converted to the following voltages:
200-220 Volt/60 Hertz/ 1 Phase **2W&G** **200 Volt/50 Hertz/ 1 Phase** **2W&G**	**100 Volt/60 Hertz/1 Phase INTERNATIONAL Models: 2W&G** **100 Volt/50 Hertz/1 Phase INTERNATIONAL Models: 2W&G** 1. Prior to connecting electric service, locate transformer configuration jumper in junction box area. 2. Remove the 208 Volt jumper and replace it with the 100 Volt jumper located in the literature packet from cylinder. 3. Remove small access cover from back of the fan motor. Locate the two internal jumper wires, brown and blue connected to motor terminals #6 and #2. Move brown wire from terminal #6 to terminal #2 and blue wire from terminal #2 to terminal #4. Be careful not to confuse light blue motor harness wire with the dark blue internal jumper. 4. Carefully check motor wire connections with wiring diagram and verify that the motors are configured for low voltage operation before replacing covers. 5. For stacked tumblers, repeat steps 1 through 4 for each upper and lower unit. 6. Sign and date conversion sticker located on back of tumbler. 7. Follow the instructions covered in ***Connecting Electrical Service*** section.
380 Volt/50 Hertz/ 3 Phase **3W&G**	**400-415 Volt/50 Hertz/3 Phase Models: 3W&G** 1. Prior to connecting electric service, locate transformer configuration jumper in junction box area. 2. Remove the 380 Volt jumper and replace it with the 415 Volt jumper located in the literature packet from cylinder. 3. For stacked tumblers, repeat steps 1 and 2 for each upper and lower unit. 4. Sign and date conversion sticker located on back of tumbler. 5. Follow the instructions covered in ***Connecting Electrical Service*** section.

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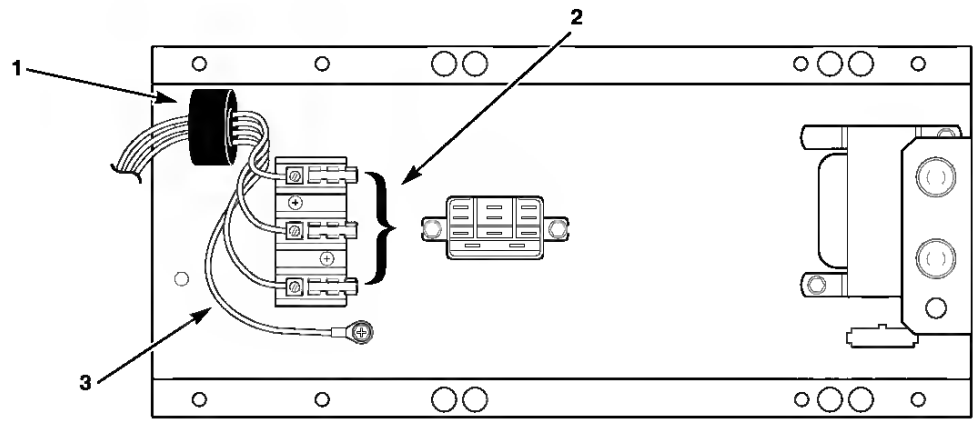
Ferrite Ring Installation

Gas and Steam OPL Micro Control Models Only

The ferrite ring provided in the literature packet must be installed over the power leads during connection of electrical service. The ferrite protects the sensitive electronic controls from destructive electrical disturbances which may be present on power lines to the machine. Failure to properly install the ferrite ring may result in damage to the electronic controls and will void control warranty.

To Install:

1. Immediately after connection of power leads and before applying power to machine, locate each of the incoming service leads including ground.
2. Snap the ferrite ring closed over all of the service leads inside of the control tray as shown. It is important that the ferrite ring be installed inside the control tray. Refer to *Figure 14*. Do not install the ferrite outside of the box or other area. Make sure that service leads are in the center of the ferrite before closing the ring so as not to pinch or damage leads.



1	Ferrite Ring
2	Electrical Connections V.A.C.~
3	Ground Wire

Figure 14

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Electrical Requirements for Gas and Steam Models

Refer to *Table 9* and *Table 10*.

NOTE: Minimum wire sizes are obtained from Canadian Electrical Code Table 2 for 75°C Conductors and are intended for use as a guideline only. Electrical connections should be made only by a qualified electrical contractor in accordance with all applicable local and national requirements.

NOTE: Electrical specifications below are subject to change without notice. Always refer to product serial plate for most current specifications of product being installed.

NOTE: Use copper conductors only.

NOTE: Connect to individual branch circuit.

NOTE: 3 Phase Only – Each tumbler must be connected to its own individual branch circuit breaker, not fuses, to avoid the possibility of "single phasing" and causing premature failure of the motor(s).

For 25, 30 and 35 Pound Gas and Steam Models:

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm^2)]
120V/60Hz/1ph	L1, Neutral, and ground	12.0	15	1	14 (2.08)
208-240V/60Hz/1ph	L1, L2, Neutral, and ground	6.7	10	2	14 (2.08)
120V/60Hz/1ph	L1, Neutral, and ground	7.5**	10	1	14 (2.08)
208-240V/60Hz/1ph	L1, L2, Neutral, and ground	4.5**	10	2	14 (2.08)
100V/60Hz/1ph	L1, Neutral, and ground	11.0	15	1	14 (2.08)
200-220V/60Hz/1ph	L1, Neutral, and ground	5.8	10	1	14 (2.08)
100V/50Hz/1ph	L1, Neutral, and ground	12.1	20	1	12 (3.31)
200V/50Hz/1ph	L1, Neutral, and ground	7.5	10	1	14 (2.08)
230-240V/50Hz/1ph	L1, Neutral, and ground	7.5	10	1	14 (2.08)
200-208V/60Hz/3ph	L1, L2, L3, and ground	3.2	10*	3	14 (2.08)
240V/60Hz/3ph	L1, L2, L3, and ground	3.2	10*	3	14 (2.08)
200V/50Hz/3ph	L1, L2, L3, and ground	2.9	10*	3	14 (2.08)
230-240V/50Hz/3ph	L1, L2, L3, and ground	3.5	10*	3	14 (2.08)
380V/50Hz/3ph	L1, L2, L3, and ground	1.5	10*	3	14 (2.08)
400-415V/50Hz/3ph	L1, L2, L3, and ground	1.6	10*	3	14 (2.08)
460-480V/60Hz/3ph	L1, L2, L3, and ground	1.6	10*	3	14 (2.08)

* 3 Phase machines should not have fuses, breakers only.
** Special low Amp blower model, 25 Pound only

Table 9

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For T30 Gas and Steam Models (For Total Machine):

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm^2)]
120V/60 Hz/1ph	L1, Neutral, and ground	16.0	20	1	12 (3.31)
208-240V/60Hz/ 1ph	L1, L2, Neutral, and ground	8.0	10	2	14 (2.08)
100V/60Hz/1ph	L1, Neutral, and ground	22.0	30	1	10 (5.26)
200-220V/60Hz/ 1ph	L1, Neutral, and ground	11.6	15	1	14 (2.08)
100V/50Hz/1ph	L1, Neutral, and ground	24.2	35	1	8 (8.37)
200V/50Hz/1ph	L1, Neutral, and ground	15.0	20	1	12 (3.31)
230-240V/50Hz/ 1ph	L1, Neutral, and ground	15.0	20	1	12 (3.31)
200-208V/60Hz/ 3ph	L1, L2, L3, and ground	6.4	10*	3	14 (2.08)
240V/60Hz/3ph	L1, L2, L3, and ground	6.4	10*	3	14 (2.08)
200V/50Hz/3ph	L1, L2, L3, and ground	5.8	10*	3	14 (2.08)
230-240V/50Hz/ 3ph	L1, L2, L3, and ground	7.0	10*	3	14 (2.08)
380V/50Hz/3ph	L1, L2, L3, and ground	3.0	10*	3	14 (2.08)
400-415V/50Hz/ 3ph	L1, L2, L3, and ground	3.2	10*	3	14 (2.08)
460-480V/60Hz/ 3ph	L1, L2, L3, and ground	3.3	10*	3	14 (2.08)

* 3 Phase machines should not have fuses, breakers only.

Table 10

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Electrical Requirements for Electric Models

Refer to *Table 11*, *Table 12* and *Table 13*.

NOTE: Minimum wire sizes are obtained from Canadian Electrical Code Table 2 for 75°C Conductors and are intended for use as a guideline only. Electrical connections should be made only by a qualified electrical contractor in accordance with all applicable local and national requirements.

NOTE: Electrical specifications below are subject to change without notice. Always refer to product serial plate for most current specifications of product being installed.

NOTE: Use copper conductors only.

NOTE: Connect to individual branch circuit.

NOTE: 3 Phase Only – Each tumbler must be connected to its own individual branch circuit breaker, not fuses, to avoid the possibility of "single phasing" and causing premature failure of the motor(s).

For 9 kW 25 Pound Electric Models:

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm^2)]
400V/50Hz/3ph	L1, L2, L3, and ground	16	20*	3	12 (3.31)

For 12 kW 25 Pound Electric Models:

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm^2)]
208V/60Hz/1ph	L1, L2, Neutral, and ground	64	80	2	4 (21.2)
240V/60Hz/1ph	L1, L2, Neutral, and ground	57	80	2	4 (21.2)
200V/50Hz/1ph	L1, Neutral, and ground	63	80	1	4 (21.2)
230-240V/50Hz/ 1ph	L1, Neutral, and ground	58	80	1	4 (21.2)
200-208V/60Hz/ 3ph	L1, L2, L3, and ground	37	50*	3	6 (13.3)
200V/50Hz/3ph	L1, L2, L3, and ground	36	50*	3	6 (13.3)
230-240V/50Hz/ 3ph	L1, L2, L3, and ground	33	50*	3	6 (13.3)
240V/60Hz/3ph	L1, L2, L3, and ground	33	50*	3	6 (13.3)
380V/50Hz/3ph	L1, L2, L3, and ground	20	25*	3	10 (5.26)
400-415V/50Hz/ 3ph	L1, L2, L3, and ground	18	25*	3	10 (5.26)
460-480V/60Hz/ 3ph	L1, L2, L3, and ground	16	25*	3	10 (5.26)

* 3 Phase machines should not have fuses, breakers only.

Table 11

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For 21 kW Models:
30 Pound Electric
T30 Electric not available in single phase.

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm^2)]
208V/60Hz/1ph	L1, L2, Neutral, and ground	108	150	2	1/0 (53.5)
240V/60Hz/1ph	L1, L2, Neutral, and ground	94	125	2	1 (42.4)
200V/60Hz/1ph	L1, Neutral, and ground	108	150	1	1/0 (53.5)
200V/50Hz/1ph	L1, Neutral, and ground	105	150	1	1/0 (53.5)
230-240V/50Hz/1ph	L1, Neutral, and ground	95	125	1	1 (42.4)
200-208V/60Hz/3ph**	L1, L2, L3, and ground	62***	80*	3	4 (21.2)
200V/50Hz/3ph**	L1, L2, L3, and ground	60	80*	3	4 (21.2)
230-240V/50Hz/3ph**	L1, L2, L3, and ground	55***	70*	3	4 (21.2)
240V/60Hz/3ph**	L1, L2, L3, and ground	54***	70*	3	4 (21.2)
380V/50Hz/3ph**	L1, L2, L3, and ground	33***	45*	3	8 (8.37)
380V/50Hz/3ph (035E Model)	L1, L2, L3, and ground	34	45*	3	8 (8.37)
400-415V/50Hz/3ph**	L1, L2, L3, and ground	31***	40*	3	8 (8.37)
460-480V/60Hz/3ph**	L1, L2, L3, and ground	27***	35*	3	8 (8.37)

* 3 Phase machines should not have fuses, breakers only.
** These serial plate voltages are only options available on the 30 Pound Single and Stacked electric models. Current (Amp) is for one pocket only.
*** Per heater on T30 electric models, each has two heaters.

Table 12

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For 24 kW Models:
35 Pound Electric

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm^2)]
208V/60Hz/1ph	L1, L2, Neutral, and ground	122	175	2	2/0 (67.5)
240V/60Hz/1ph	L1, L2, Neutral, and ground	107	150	2	1/0 (53.5)
200V/60Hz/1ph	L1, Neutral, and ground	122	175	1	2/0 (67.5)
200V/50Hz/1ph	L1, Neutral, and ground	119	150	1	1/0 (53.5)
230-240V/50Hz/ 1ph	L1, Neutral, and ground	108	150	1	1/0 (53.5)
200-208V/60Hz/ 3ph	L1, L2, L3, and ground	71	90*	3	3 (26 7)
200V/50Hz/3ph	L1, L2, L3, and ground	65	90*	3	3 (26 7)
230-240V/50Hz/ 3ph	L1, L2, L3, and ground	62	80*	3	4 (21.2)
240V/60Hz/3ph	L1, L2, L3, and ground	62	80*	3	4 (21.2)
380V/50Hz/3ph	L1, L2, L3, and ground	38	50*	3	6 (13.3)
400-415V/50Hz/ 3ph	L1, L2, L3, and ground	35	45*	3	8 (8.37)
460-480V/60Hz/ 3ph	L1, L2, L3, and ground	31	40*	3	8 (8.37)

* 3 Phase machines should not have fuses, breakers only.

Table 13

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Steam Requirements

NOTE: The maximum allowable steam pressure for use with 60 Hertz or 50 Hertz tumblers is 125 psig (8.6 bar). In no case may the pressure exceed the above value.

Obtain specific steam service pipe sizes from the steam system supplier or a qualified steam fitter.

- Refer to *Figure 15* for proper steam pipe configurations.
- To prevent condensate draining from headers to tumbler, piping should have a minimum 12 inch rise (305 mm) above respective header. Do not make steam connection to header with a horizontal or downward facing tee or elbow.
- Whenever possible, horizontal runs of steam lines must drain, by gravity, to respective steam header. Water pockets, or an improperly drained steam header, will provide wet steam, causing improper operation of tumbler. If pockets or improper drainage cannot be eliminated, install a bypass trap to drain condensate from the low point in the steam header to the return.
- In both steam supply and steam return line, it is recommended that each have a pipe union and shut-off valve. This will enable you to disconnect the steam connections and service the tumbler while your laundry facility is in operation.
- Connect the steam solenoid valve to the related steam coil inlet connection with nipples, flex hoses, unions and tee.
- Strainers may require cleaning due to materials from hoses or pipes.
- Install bucket trap with built-in strainer and check valve. A vacuum breaker is optional. For successful operation of tumbler, install trap 18 inches (457 mm) below coil and as near to the tumbler as possible. Inspect trap carefully for inlet and outlet markings and install according to trap manufacturer's instructions. If steam is gravity returned to boiler, omit trap but install optional vacuum breaker and check valve in return line near tumbler. Gravity return requires entire return plumbing be below steam coil outlet.
- Install union and shut-off valve in return line and make final pipe connections to return header.

NOTE: To prevent water bammering, route return lines below outlets of steam coils.

Piping Recommendations

- Trap each steam coil individually. Always keep the trap clean and in good working condition. Refer to *Table 14* for Trap Sizing.
- When tumbler is on the end of a line of equipment, extend header at least 4 feet (1.2 meters) beyond tumbler. Install shut-off valve, union, check valve and bypass trap at end of line. If gravity return to boiler, omit trap.
- Insulate steam supply and return line for safety of operator and safety while servicing tumbler.
- Keep tumbler in good working condition. Repair or replace any worn or defective parts.

WARNING

All system components must have a 125 psig (10 bar) working pressure. Shut-off valves must be installed upstream of the steam solenoid valve and downstream of each steam trap so components can be isolated for maintenance or emergency purposes.

All components (solenoid valve, traps) must be supported to minimize loads on the tumbler steam coil connections.

W480

Steam Trap Sizing		
Tumbler Model	**Number of Coil Rating**	**Steam Trap Size (lb/hr Condensate)**
25, 30 Pound	4	120
	2	105
T30	4	105
	2	95
35 Pound	4	140
	2	120

Table 14

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Installing Steam Trap and Making Condensate Return Connections

The steam trap must be installed and the coil outlet connections must be connected to the condensate return lines. The following steps outline the procedure for installing the steam trap and connecting the condensate return lines. Refer to *Figure 15* for typical installations.

1. Use flexible lines between steam inlet solenoid and steam coils, as well as outlet between steam coil and traps.
2. If necessary, install a strainer at the end of each flexible hose.
3. Install a steam trap to each strainer.

IMPORTANT: Steam trap must be installed a minimum of 18 inches (457 mm) below the steam coil outlet connections.

4. Install a shut-off valve to each steam trap.
5. Connect to the condensate return lines.
6. For steam solenoid valve wiring connections, refer to Wiring Diagram supplied with tumbler.

WARNING

The flexible steam hoses connecting the coil outlet connections and steam traps must have a minimum of 125 psig (pounds per square inch gauge) (8.79 kg/ sq. cm.) working pressure. A shut-off valve must be installed downstream from each steam trap so the condensate return line can be isolated in event a steam trap requires maintenance.

Each steam trap must be supported so minimum load is exerted on the coil outlet connection.

W066

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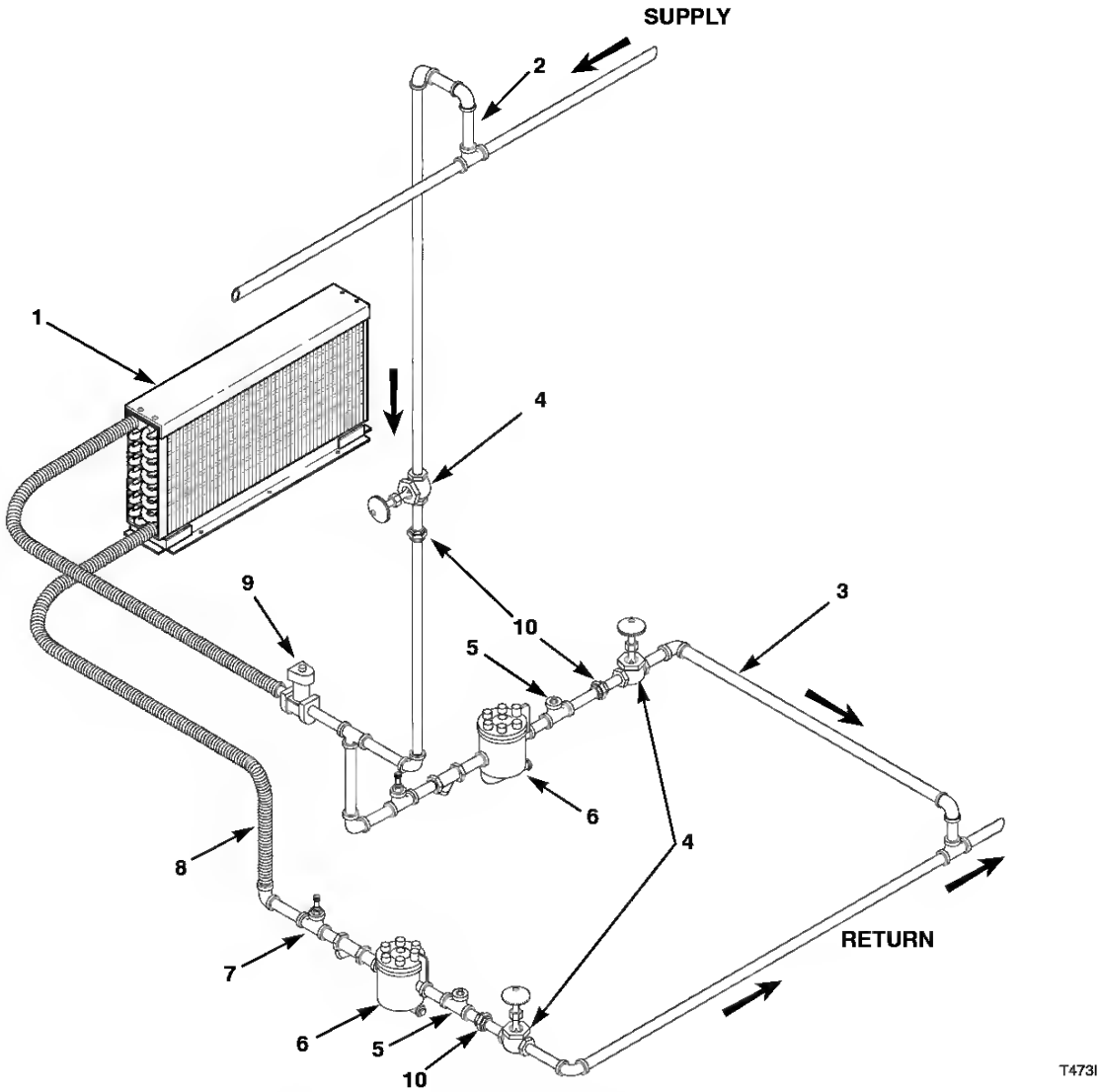

Note: Refer to *Table 15* for sizing of steam lines. Piping must also be sized accordingly for length of runs, and number of elbows.

1	Steam Coil	**6**	Trap with Built-In Strainer
2	12 in. (305 mm) Riser	**7**	Vacuum Breaker (Optional)
3	Condensate Return Line from Supply Line	**8**	18 in. (457 mm) Drop
4	Shut-Off Valve	**9**	Solenoid Valve (Supplied with machine)
5	Check Valve	**10**	Union

Figure 15

Model	Steam Pressure PSI (bar)	Minimum Pipe Diameter	Steam Trap Size * (Pounds Condensate/Hour)
25/30 Pound	15-100 (1-6.9)	3/4 in. NPT	134
T30	15-100 (1-6.9)	3/4 in. NPT	110
35 Pound	15-100 (1-6.9)	3/4 in. NPT	166

* Based on 100 PSI.

Table 15

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Notes

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Adjustments

Loading Door Switch

Non-CE Models

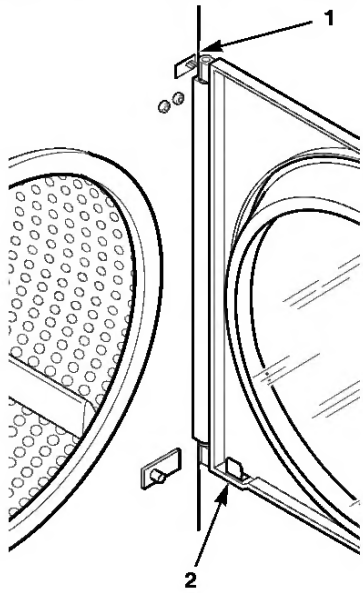
The door switch should be adjusted so the cylinder stops when door is opened 2 inches (51 mm) plus or minus 0.25 inch (6 mm). This switch is a normally open switch and is closed by the hinge cam when the door is closed. If adjustment is required, refer to *Figure 16* and proceed as follows:

1. Close door and start tumbler, slowly open loading door. Cylinder and heat system should shut off when door is open 2 inches (51 mm) plus or minus 0.25 inch (6 mm).
2. Slowly close the loading door. When door is 2 inches (51 mm) from being fully closed, the door switch actuating bracket (located on the door) should depress the button and the switch arm with an audible "click."
3. If the actuating bracket does not operate the switch at the appropriate door closure, bend the actuating switch arm in or out to achieve proper actuation.

CE Models Through Serial No. 0208002174

CE tumblers have a second door switch near the top of the door (refer to *Figure 16*). This switch also should be adjusted so cylinder stops when door is opened within 0 – 2 inches (0 – 51 mm). This switch is normally closed and is opened by the hinge cam when the door is opened. If adjustment is needed, refer to *Figure 16* and proceed as follows:

1. Remove lower switch actuator *(Figure 16)* so upper switch "click" can be heard.
2. Loosen upper door switch screws just enough so switch can be moved left and right. Move switch right if door opens too far before switch clicks. Move switch left if door doesn't open far enough before switch clicks.
3. Retighten door switch screws and retest. Repeat step 2 if further adjustment is needed.
4. Reinstall lower switch actuator and retest its switch.



1	CE Tumblers Only
2	Lower Switch Actuator

Figure 16

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Airflow Switch

The airflow switch is set at the factory for proper operation. No adjustment necessary.

The airflow switch operation may be affected by shipping tape still in place, lack of make-up air, or an obstruction in the exhaust duct. These should be checked and the required corrective action taken before attempting to adjust airflow switch.

WARNING

The tumbler must not be operated if the airflow switch does not operate properly. Faulty airflow switch operation may cause an explosive gas mixture to collect in the tumbler.

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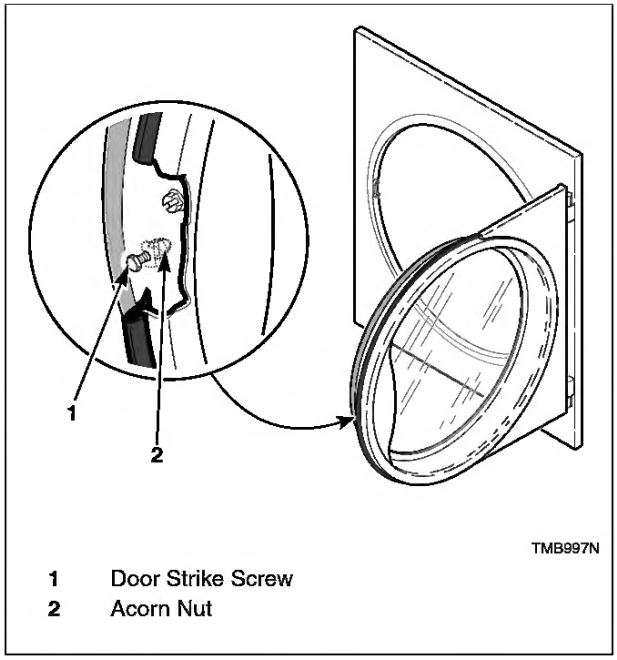
IMPORTANT: Airflow switch vane must remain closed during operation. If it opens and closes during the drying cycle, this indicates insufficient airflow through the tumbler. If switch remains open, or pops open and closed during the cycle, the heating system will shut off. The cylinder and fan will continue to operate even though the airflow switch is indicating insufficient airflow.

Door Strike

The door strike must be adjusted to have sufficient tension to hold loading door closed against force of the load tumbling against it. There is proper adjustment of pull force when 8 to 15 pounds (35.6 N – 66.7 N) is required to open door.

If adjustment is required, refer to *Figure 17* and proceed as follows:

To adjust, open door, loosen acorn nut, and turn door strike screw in or out as required. Retighten acorn nut.



1 Door Strike Screw
2 Acorn Nut

Figure 17

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Removing Tumbler from Service

If the tumbler is to be removed from service, perform the following steps where applicable:

- Turn off electrical supply external to machine.
- Turn off electrical disconnect on machine.
- Turn off gas supply external to machine.
- Turn off manual gas shut-off valve on machine.
- Turn off steam supply external to macbine.
- Remove all electric, gas and steam connections.

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